



Hexion Inc.
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hexion.com

December 10, 2021

Mr. Jonathan Wright
Permit Writer
Lane Regional Air Protection Agency (LRAPA)
1010 Main Street, Springfield, Oregon 97477
jonathan@lrapa.org

RE: *Hexion Springfield – Cleaner Air Oregon Emissions Inventory Submittal*

Dear Mr. Wright:

Hexion Inc. (Hexion) is pleased to timely submit the Cleaner Air Oregon (CAO) Emission Inventory for its Springfield, Oregon facility. On October 25, 2021, LRAPA extended the deadline for submittal of the CAO Emissions Inventory to December 10, 2021. Accordingly, with this letter, Hexion is submitting the enclosed CAO Emissions Inventory Form and associated documents to comply with the requirement to submit an emissions inventory pursuant to Oregon Administrative Rule (OAR) 340-245-0030, as applicable under LRAPA's rules.

The enclosed inventory form and supporting documentation was prepared using best engineering estimates, process knowledge, source test data, and/or published emission factors for toxic air contaminants listed in OAR 340-247-8010, Table 1. Hexion reserves the right to update the enclosed documentation upon obtaining updated and/or additional information.

FACILITY DESCRIPTION

The Springfield Facility, located at 470 South Second Street in Springfield, Oregon, is a resin manufacturing facility that operates under Standard ACDP 200510 and the following Standard Industrial Classification (SIC) Codes:

- ▶ 2821: Synthetic Resin Manufacturing
- ▶ 2869: Synthetic Formaldehyde Manufacturing
- ▶ 4961: Combustion Source

Formaldehyde is produced and used primarily on-site as a raw material for various type of resins. Two (2) tail-gas boilers are used to control emissions of volatile organic compounds (VOC), hazardous air pollutants (HAPs) and toxic air contaminants (TACs), while additionally providing steam to the other equipment at the facility. The Springfield Facility operates the following toxic emission activity types for multiple products:

- ▶ Storage tanks for various products manufactured at the facility,
- ▶ Process fugitives (valves, fittings, pumps),
- ▶ Loading of products,
- ▶ Mixers,
- ▶ Reactors,
- ▶ Blenders,
- ▶ Washwater pits,

- ▶ Tail-gas fired boilers used for steam production and control of VOCs, HAPs, and TACs associated with formaldehyde production,
- ▶ Natural gas-fired boilers used for additional steam production capacity,
- ▶ A diesel-fired emergency generator, and
- ▶ Various control equipment such as scrubbers and baghouses.

Historically Hexion operated the Resin Drying Pad, in which waste resin solids were placed under an awning and were dried at ambient temperatures. Hexion decommissioned the Resin Drying Pad emission unit in 2021. The current operating practice, which Hexion intends to maintain going forward, is to place waste resin solids in completely sealed dewatering boxes, allowing the solids to dry with negligible, if any, emissions. As such, while Hexion has included past emissions in form CAO520 from this historical emission unit, because this unit no longer exists, Hexion has requested zero throughput for it in the facility's requested PTE and capacity.

Additionally, loading and transloading to totes of glycerin no longer occur at the Springfield facility (this practice was discontinued years ago) and as such these activities have not been included in the emission inventory submittal.

CAO EMISSION INVENTORY METHODOLOGY

Identification of Toxic Emission Units (TEUs)

Hexion has designated toxic emission units (TEUs) consistent with permitted emission units wherever possible. Attachment 1 includes a table of permitted emission units and corresponding TEU IDs. Hexion has identified and included the following TEUs which were not regulated prior to the inception of the CAO program:

- ▶ Various emission units with the potential to emit previously non-regulated pollutants, including:¹
 - Tank ST-8 (liquid ammonia storage)
 - Piping fugitives associated with utilizing liquid ammonia
 - Tanks C2, R4, R5 and ST-13 (sodium hydroxide storage)
- ▶ Diesel-fired Emergency Generator
 - Emissions from this source have been included as part of this submittal based on the recent rulemaking for CAO adopted and finalized on November 17, 2021, which had updates to the list of Exempt TEUs. This emission unit historically was classified as a categorically insignificant activity as the horsepower of the engine is less than 3,000 horsepower (hp).

Identification of Toxic Air Contaminants Potentially Emitted

As part of the emission calculation process, Hexion reviewed processed materials at the Springfield Facility to determine the presence of TACs as regulated under OAR 340-247-8010, Table 1. The enclosed emission inventory form reflects TACs identified that Hexion estimated could be emitted from the various TEUs at the Springfield Facility. TACs that were either determined to remain in the final product completely intact or would not otherwise be emitted via material handling (i.e., solid materials added to reactors), were excluded from this emission inventory submittal.

¹ Emission unit ST-1 (historically stored sulfuric acid) was also identified, however this unit is no longer in service and has therefore been excluded from the emission inventory.

Actual and Potential Throughputs

For potential annual throughput presented in this inventory as the requested PTE, Hexion utilized the annual throughput and operating parameters limitations as contained in Standard ACDP 200510, with the following refinements:

- ▶ Formaldehyde storage and loading:
 - Potential annual throughput was estimated by determining the maximum amount of formaldehyde over the past five years plus 20% to account for potential market increase.
- ▶ UF, PF and PRF resin manufactured, stored and loaded
 - Potential annual throughput was estimated by determining the maximum amount of UF,PF and PRF resin over the past five years plus 20% to account for potential market increase.
- ▶ Diesel-fired emergency generator:
 - Hexion's current practice is to test the diesel fired emergency generator 30 minutes per week, for a total of 26 hours per year. To allow operational flexibility, Hexion is requesting a limit of 30 hours per year and one hour per day.
- ▶ Storage tanks previously not regulated under Hexion's Standard ACDP:
 - Potential throughput was estimated based on expected maximum throughputs per discussions with facility personnel.

To estimate potential daily throughputs, Hexion utilized the maximum production rate for each TEU identified. It should be noted that the Springfield Facility operates 24 hours 7 days per week and as such, potential daily throughputs are generally representative of continuous operation unless otherwise noted in the emission inventory form.

For actual annual throughputs presented in this emission inventory submittal, Hexion utilized throughout information for the 2020 calendar year for all significant TEUs at the Springfield Facility.² Daily actual throughput estimates were calculated assuming the maximum daily production rate, consistent with the potential daily throughputs calculation.

Emission Calculation Methodology

To calculate emissions from the various TAC emitting activities, Hexion utilized approved methodology as regulated in Standard ACDP 200510 with the following refinements:

- ▶ Storage Tank Emissions
 - Hexion has updated emission calculations for storage tanks to be reflective of the recent updates to methodologies in *AP-42, Fifth Edition, Volume I Chapter 7: Liquid Storage Tanks (Finalized in March 2020)*. Historically, Hexion calculated emissions utilizing current AP-42 guidance at the time of each permit renewal application and/or notice of intent to construct (NC). Hexion has included separate tank calculation files for LRAPA to review. Total emissions for each TEU are included in the form, with the associated emission factor back calculated to provide a form specific single value.
- ▶ Fugitive Emissions
 - Hexion has historically utilized factors taken from the Texas Commission on Environmental Quality (TCEQ) document Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives, dated October 2000. See SOCM I Without C2 emission factors in table titled Uncontrolled SOCM I Fugitive Emission Factors. Furthermore, as the facility is implementing a Title 40 Code of Federal Regulations (CFR) Part 63, Subpart H (HON) program, the Facility is utilizing the equivalent TCEQ

² OAR 340-245-0040(4)(a)(B)(i)(I)

control efficiencies. Furthermore, for demonstration of compliance with the equipment in heavy liquid service the facility has historically conducted visual inspection at least weekly for the Formaldehyde units. As such, the fugitive emissions are representative of those work practices and account for the operational practices at the facility.

► Washwater Pit Emissions

- Ammonia emissions from washwater pits have been calculated using Toxchem software (as opposed to Water9 which the site historically has used to estimate emissions) as Toxchem is the latest methodology.
- To estimate formaldehyde, methanol, and phenol, Hexion conducted testing per the protocol submitted to LRAPA on August 19, 2021. The pits include emissions from the pits and trenches. The results from the testing were utilized to determine annual emission from the pits and were also used to identify representative trench emissions.

► Emissions from natural gas and diesel fuel combustion

- Emissions from these emission sources have been calculated to align with Oregon DEQ's recommended emission factors in *2020 ATEI Combustion EF Search Tool*. Additionally, Hexion has included cold start emission factors for the diesel-fired emergency generator as detailed in Oregon DEQ's recommended procedures.

Enclosed Documentation

In addition to the CAO Emissions Inventory Form, Hexion has also enclosed the following per the request of LRAPA during the December 18, 2020, kick-off call with LRAPA:

► Support documentation, including:

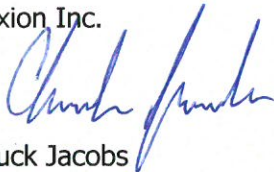
- Tank calculation files utilizing the latest AP-42, Section 7 emission calculation methodologies,
- Toxic emission calculation files detailing methodologies and emission factor references, and
- Reference table for permitted unit vs TEUs listed in the emissions inventory form.

► Site map depicting TEUs at the Springfield Facility

If you have any questions or comments about the information presented in this letter, please do not hesitate to call me at 541.741.6658. We look forward to working with LRAPA on the CAO risk assessment process.

Sincerely,

Hexion Inc.



Chuck Jacobs
Springfield Facility Site Leader

Attachments

cc: Mr. Craig Sturtz, Hexion (Columbus, Ohio)
Ms. Lacy Wood, Hexion (Columbus, Ohio)
Mr. Jesse Gonzalez, Trinity Consultants (Beaverton, Oregon)
Ms. Inaas Darrat, Trinity Consultants (Houston, Texas)
Mr. Geoffrey Tichenor, Stoel Rives (Portland, Oregon)

ATTACHMENT 1

Identification of TEUs

Table 1. Permitted Emissions Units and Designations in Toxic Emissions Inventory

Emission Source as Listed in Permit Condition 25 of Standard ACDP	Toxic Emitting Activity/Source Name in Emissions Inventory	Comments
Boiler 2 (Erie) Tail Gas	FM-2	
Boiler 6 (Johnston) Tail Gas	FM-3	
Boiler 2 (Erie) Exhaust Bypass	FM-2 Bypass	
Boiler 6 (Johnston) Exhaust Bypass	FM-3 Bypass	
Boiler 2 (Erie) Natural Gas Usage	Erie Boiler	
Boiler 6 (Johnston) Natural Gas Usage	Johnston Boiler	
Boiler 3 (Fulton) Natural Gas Usage	N/A	Source no longer operates at Springfield Facility
Boiler 4 and 5 (Miura) Natural Gas Usage	Miura Boilers	
Fugitive Emissions – Plant 2	FM-2 Fugitives	
Fugitive Emissions – Plant 3	FM-3 Fugitives	
Fugitive Emissions – Resins	RE Fugitives	
Formaldehyde Storage	Storage-FM	
Formaldehyde Loading	Loading-FM	
PF/UF Resin Produced in Reactors	Reactors-UFPF	
PF/UF/PRF Resin Storage	Storage-UFPF	
PF/UF Resin Loading	Loading-UFPF	
Triazines Stored	Storage-TZ	
Triazines Loading	Loading-TZ	
Durite LV 1259M Loading	Loading-1259M	
Durite SC748A Loading	Loading-748	
MF Resin Produced in Reactors	Reactors-MF	
MF Resin Storage	Storage-MF	
MF Resin Loading	Loading-MF	
Methanol Storage	Storage-ME	
Phenol/LPE Storage	Storage-PH	
Triethylamine Storage	N/A	No triethylamine storage tanks at facility
Triethanolamine Storage	N/A	Triethanolamine is not a regulated toxic air contaminant
Triethanolamine Rx9 Storage	N/A	Triethanolamine is not a regulated toxic air contaminant
10% Formic Acid	N/A	Formic acid is not a regulated toxic air contaminant
GN8/11 Storage	Storage-GN	
GN8/11 Loading (MeOH Contribution)	N/A	This operation no longer occurs at the Springfield Facility
GN8/11 Tote Transloading	N/A	This operation no longer occurs at the Springfield Facility
Sheer Mixer RF-300W	Mixer 1	
Sheer Mixer FM-6310L	Mixer 2	
Sheer Mixer FM-7400L	Mixer 3	
Sheer Mixer Momentive 4720	Mixer 4	
Stearic Acid Storage	N/A	Stearic Acid is not a regulated toxic air contaminant
Wax Production	Process-EW	
Slack Wax Storage	Storage-SW	
Diethylene Glycol Storage	Storage-DG	
Resin Drying Pad Throughput	Resin Drying Pad	
Urea Weigh Bin #1 Throughput	N/A	Source does not emit regulated toxic air contaminants
Urea Weigh Bin #2 Throughput	N/A	Source does not emit regulated toxic air contaminants
Dry Catalyst Loading/Production (Blender #1)	Loading-CA, Blender 1, Blender 2, Dry Catalyst PM	
Dry Catalyst Blender #2		
Dry Catalyst Vacuum Sweeper Usage		
Dry Catalyst Exhaust Fan West		
Dry Catalyst Exhaust Fan South		
RTU Dry Material Loading	N/A	Source does not emit regulated toxic air contaminants
Unpaved Roads	N/A	Source does not emit regulated toxic air contaminants
Melamine Handling	N/A	Source does not emit regulated toxic air contaminants
Adhesive Dump Hopper	N/A	Source does not emit regulated toxic air contaminants

Melamine Conveyor	N/A	Source does not emit regulated toxic air contaminants
Melamine Hopper	N/A	Source does not emit regulated toxic air contaminants
PF Washwater Storage	Storage-PF WW/SW	
Washwater Pits	Washwater Pits	
UF Seal Water Storage	Storage-UF SW	
Methanol Distillate	Storage-Distillate	
PF Distillate Storage		
UF Distillate Storage		

Table 2. Toxic Emission Units Added to Emissions Inventory

Toxic Emission Unit Description	Toxic Emitting Activity/Source Name in Emissions Inventory	Comments
Sodium Hydroxide Storage	Storage-SH	Sodium historically was not a regulated air pollutant
Aqua Ammonia Storage	Storage-AM	Ammonia historically was not a regulated air pollutant
Emergency Diesel Generator	Diesel Generator	Historically was considered an exempt TEU

Attachment 2

Supporting Emission Calculation Information

Table 1: Potential Annual Throughput / Hours of Operation

Process	Production or Usage	Unit	Note
Formaldehyde Plant 2 (Erie Boiler - Tail Gas)	8,760	hours	ACDP Condition 25
Formaldehyde Plant 3 (Johnston Boiler - Tail Gas)	8,760	hours	ACDP Condition 25
Formaldehyde Plant 2 (Erie Boiler) Exhaust Bypass	50	hours	ACDP Condition 25
Formaldehyde Plant 3 (Johnston Boiler) Exhaust Bypass	54	hours	ACDP Condition 25
Johnston Boiler Natural Gas Usage	6.0	MMscf	ACDP Condition 25
Miura Boiler Natural Gas Usage	181.0	MMscf	ACDP Condition 25
Fugitive Emissions Plant 2	8,760	hours	ACDP Condition 25
Fugitive Emissions Plant 3	8,760	hours	ACDP Condition 25
Fugitive Emissions - Resins	8,760	hours	ACDP Condition 25
Emergency Diesel Generator	26	hours	IEU Required to be in CAO
Formaldehyde Storage	57,066	tons	20% over Max Actuals (New Limit)
Formaldehyde Loading	3,619	tons	20% over Max Actuals (New Limit)
Triazines Storage	17,250	tons	ACDP Condition 25
Triazines Loading	17,250	tons	ACDP Condition 25
PF or UF Resin Produced in Reactors	160,000	tons	20% over Max Actuals (New Limit)
PF or UF Resin Storage	160,000	tons	20% over Max Actuals (New Limit)
PF or UF Resin Loading	160,000	tons	20% over Max Actuals (New Limit)
Durite LV-1259M Loading	3,375	tons	ACDP Condition 25
Durite SC-748A Loading	500	tons	ACDP Condition 25
MF Resin Produced in Reactors	17,500	tons	ACDP Condition 25
MF Resin Storage	17,500	tons	ACDP Condition 25
MF Resin Loading	17,500	tons	ACDP Condition 25
Methanol Storage	66,000	tons	ACDP Condition 25
Methanol Loading	0	tons	ACDP Condition 25
Phenol/LPE Storage	32,000	tons	Adjusted as this throughput is predicated on the PF/UF Resin Production (New Limit)
Monoethanolamine Storage	3,500	tons	ACDP Condition 25
Triethanolamine Storage	1,487	tons	ACDP Condition 25
Triethanolamine Rx9 Storage	38	tons	ACDP Condition 25
10% Formic Acid	4,127	tons	ACDP Condition 25
GN11 & GN8 Storage	6,300	tons	ACDP Condition 25
GN11 & GN8 Tote Transloading	0	tons	This operation no longer occurs at the Springfield Facility

Sheer Mixer RF-300W	23,652,000	gallons	ACDP Condition 25
Sheer Mixer FM-6310L	27,422,609	gallons	ACDP Condition 25
Sheer Mixer FM-7400L	75,085,714	gallons	ACDP Condition 25
Sheer Mixer Momentive 4720	13,770,000	gallons	ACDP Condition 25
Stearic Acid Storage	1,431	tons	ACDP Condition 25
Wax Production	71,540	tons	ACDP Condition 25
Slack Wax Storage	50,078	tons	ACDP Condition 25
Diethylene Glycol Storage	9,588	tons	ACDP Condition 25
Resin Drying Pad Throughput	0	tons	SFO Paragraph 11.B
Urea Weigh Bin #1 Throughput	50,000	tons	ACDP Condition 25
Urea Weigh Bin #2 Throughput	50,000	tons	ACDP Condition 25
Dry Catalyst Loading/Production (Blender #1)	3,893	tons	ACDP Condition 25
Dry Catalyst Loading/Production (Blender #1)	411	MMscf	ACDP Condition 25
Blender #1 Fentak	3,452	tons	ACDP Condition 25
Dry Catalyst Blender 1 Usage	1,560	hours	ACDP Condition 25
Dry Catalyst Blender 2 Usage	561	MMscf	ACDP Condition 25
Dry Catalyst Blender 2 Usage	1,560	hours	ACDP Condition 25
Dry Catalyst Vacuum Sweeper Usage	780	hours	ACDP Condition 25
Dry Catalyst Exhaust Fan West	18.7	MMscf	ACDP Condition 25
Dry Catalyst Exhaust Fan South	18.7	MMscf	ACDP Condition 25
Dry Catalyst Exhaust Fan Usage	2,080	hours	ACDP Condition 25
RTU Dry Material Loading	750	tons	ACDP Condition 25
Melamine Handling	8,760	hours	ACDP Condition 25
Adhesive Dump Hopper	1,000	tons	ACDP Condition 25
Melamine Conveyor	455	MMscf	ACDP Condition 25
Melamine Hopper	263	MMscf	ACDP Condition 25
PF Washwater Storage	21,605	tons	ACDP Condition 25
Washwater Pits	1,464,540	gallons	ACDP Condition 25
UF Seal Water Storage	18,630	tons	ACDP Condition 25
Methanol Distillate	777	tons	ACDP Condition 25
PF Distillate Storage	5,839	tons	ACDP Condition 25
UF Distillate Storage	2,718	tons	ACDP Condition 25
Aqua Ammonia	1,290	tons	For CAO Required Tanks
50% Caustic	8,105	tons	For CAO Required Tanks
25% Caustic	51	tons	For CAO Required Tanks
Methanol Scrubber Blowdown Water Storage (Methanol Distillate)	260	tons	New Limit for Methanol Scrubber Blowdown Water to be Recylcd into Process

Table 2: Facility Wide Emissions Summary

Process	Throughput	Units	Criteria Pollutants						Hazardous Air Pollutants																	
			PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	VOC	HCHO	MeOH	Phenol	Cresols	Ethylene Glycol	Diethylene Glycol	1,3 Butadiene	Acrolein	Acetaldehyde	Benzene	Naphthalene	Toluene	Xylene	Dichlorobenzene	Hexane	Polycyclic Organic Matter	MIBK	ATE
			(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)
Formaldehyde Plant 2 Exhaust Bypass	50	hours	--	--	--	--	--	3.21	0.75	0.02	0.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Formaldehyde Plant 3 Exhaust Bypass	54	hours	--	--	--	--	--	2.93	1.54	0.12	0.22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fugitive Emissions - Plant 2	8,760	hours	--	--	--	--	--	0.86	0.38	0.48	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fugitive Emissions - Plant 3	8,760	hours	--	--	--	--	--	1.43	0.57	0.86	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fugitive Emissions - Resin	8,760	hours	--	--	--	--	--	1.77	0.18	0.10	0.74	1.40E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	0.09
Emergency Diesel Generator	76	hours	0.03	0.03	0.03	0.43	0.09	0.03	1.20E-03	--	--	--	--	--	1.52E-04	2.36E-05	5.46E-04	1.30E-04	1.37E-05	7.35E-05	2.96E-05	--	1.88E-05	--	--	--
Formaldehyde Storage	57,066	tons	--	--	--	--	--	1.24	0.11	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Formaldehyde Loading	3,619	tons	--	--	--	--	--	0.18	0.02	2.59E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Triazine Storage	17,250	tons	--	--	--	--	--	0.68	--	0.06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Triazine Loading	17,250	tons	--	--	--	--	--	0.25	--	0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PF/UF Resin Produced in Reactors ¹	160,000	tons	--	--	--	--	--	13.55	0.21	1.71	0.02	3.34E-04	0.09	--	--	--	--	--	--	--	--	--	--	--	--	0.88
PF/PRF/UF Resin Storage ²	160,000	tons	--	--	--	--	--	0.27	0.09	0.15	1.95E-03	--	1.07E-04	--	--	--	--	--	--	--	--	--	--	--	3.87E-04	1.19E-04
PF/UF Resin Loading ³	160,000	tons	--	--	--	--	--	1.53	0.23	0.37	1.32E-02	--	0.08	3.36E-07	--	--	--	--	--	--	--	--	--	--	4.13E-03	0.02
Durite LV-1259M Loading	3,375	tons	--	--	--	--	--	0.13	9.25E-04	0.08	--	--	7.98E-08	--	--	--	--	--	--	--	--	--	--	--	1.28E-04	--
Durite SC-740A Loading	500	tons	--	--	--	--	--	6.96E-03	5.45E-05	6.46E-03	3.10E-06	--	5.51E-09	--	--	--	--	--	--	--	--	--	--	--	4.13E-06	--
MF Resin Produced in Reactors	17,500	tons	--	--	--	--	--	2.22	0.03	0.30	--	--	1.59E-03	--	--	--	--	--	--	--	--	--	--	--	--	--
MF Resin Storage	17,500	tons	--	--	--	--	--	0.04	6.64E-05	0.04	--	--	--	1.32E-06	--	--	--	--	--	--	--	--	--	--	--	--
MF Resin Loading	17,500	tons	--	--	--	--	--	0.31	7.80E-04	0.28	--	--	5.51E-08	--	--	--	--	--	--	--	--	--	--	--	--	--
Methanol Storage	66,000	tons	--	--	--	--	--	0.29	--	0.29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.05E-05
Phenol/LPE Storage	32,000	tons	--	--	--	--	--	1.25	--	--	1.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Monethanolamine Storage	3,500	tons	--	--	--	--	--	0.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Triethanolamine Storage	See Throughput tab ⁴		--	--	--	--	--	4.34E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Johnston Boiler Tail Gas Usage	8,760	hours	--	--	--	0.64	0.23	0.05	2.63E-03	1.31E-02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Johnston Boiler Natural Gas Usage	6	MMscf	0.02	0.02	1.80E-03	0.30	0.25	0.02	3.69E-05	--	--	--	--	--	--	8.10E-06	9.30E-06	1.74E-05	9.00E-07	7.95E-05	5.91E-05	3.60E-06	1.38E-05	2.65E-07	--	--
Erie Boiler Tail Gas Usage	8,760	hours	--	--	--	0.41	0.08	0.04	6.04E-04	7.27E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Miura Boiler No. 1 Natural Gas	181	MMscf	0.34	0.34	0.03	4.53	3.80	0.68	7.69E-04	--	--	--	--	--	1.22E-04	1.95E-04	3.62E-04	1.36E-05	1.66E-03	1.23E-03	5.43E-05	2.85E-04	3.99E-06	--	--	
Miura Boiler No. 2 Natural Gas			0.34	0.34	0.03	4.53	3.80	0.68	7.69E-04	--	--	--	--	--	1.22E-04	1.95E-04	3.62E-04	1.36E-05	1.66E-03	1.23E-03	5.43E-05	2.85E-04	3.99E-06	--	--	
Resin Drying Pad Throughput	SFO Paragraph 11.B		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Urea Weigh Bin #1 Throughput	50,000	tons	0.50	0.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Urea Weigh Bin #2 Throughput	50,000	tons	0.50	0.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dry Catalyst	See Dry Catalyst Tab		1.42	1.42	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Melamine Handling	See Melamine Tab		1.03	1.03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Road Emissions	See Road Emissions Tab		0.18	0.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Blender 1 - Catalyst Plant	See Blender 1 - Catalyst Plt Tab		--	--	--	--	--	0.02	1.36E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Blender 1 - Fentak ⁵	3,452	tons	--	--	--	--	--	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Blender 2 - Catalyst Plant	See Blender 2 - Catalyst Plt Tab		--	--	--	--	--	0.31	0.31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Adhesive Dump Hopper	See Adhesive Dump Tab		1.00	1.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RTU Mixer	750	tons	0.23	0.23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Catalyst Loading	3,893	tons	--	--	--	--	--	1.22E-03	1.13E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Stearic Acid Storage	1,431	tons	--	--	--	--	--	2.99E-05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Emulsified Wax Process	71,540	tons	--	--	--	--	--	2.30E-05	--	5.20E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Emulsified Wax Loading	71,540	tons	--	--	--	--	--	0.07	--	4.54E-03	--	--	--	--	--	--	--	--	--	0.65	--	--	--	--	--	--
Emulsified Wax Storage	71,540	tons	--	--	--	--	--	0.28	--	5.62E-04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Slack Wax Storage	50,078	tons	--	--	--	--	--	0.37	--	--	--	--	--	--	--	--	--	--	--	0.37	--	--	--	--	--	--
Distillate Storage (UF, PF & Methanol)	9,335	tons	--	--	--	--	--	1.19E-02	1.98E-04	1.17E-02	N/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PF Washwater/Seal Water Storage	21,605	tons	--	--	--	--	--	1.27E-03	1.87E-06	1.27E-03	1.72E-06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
UF Seal Water Storage	18,630	tons	--	--	--	--	--	1.45E-03	1.32E-05	1.43E-03	1.20E-07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Washwater Pit	--	tons	--	--	--	--	--	1.84	--	1.84	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GN8/11 Storage	6,300	tons	--	--	--	--	--	7.13E-03	--	7.13E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GN8/11 Loading (MeOH Contribution)	0	tons	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GN8/11 Tote Transloading	0	tons	--	--	--	--	--	0.00E+00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Shear Mixer	Review Materials Using Shear Mixer ⁵		--	--	--	--	--	0.31	1.81E-03	0.17	1.44E-03	--	4.73E-05	1.07E-08	--	--	--	--	--	--	--	--	--	--	4.10E-04	--
10% Formic Acid Storage	4,127	tons	--	--	--	--	--	2.19E-03	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diethylene Glycol Storage	9,588	tons	--	--	0.08	10.83	14.39	33.10	2.27	7.16	2.03	3.48E-04	0.17	9.75E-06	1.52E-04	2.76E-04	9.45E-04	8.71E-04	4.18E-05	1.02	2.55E-03	1.12E-04	6.03E-04	8.25E-06	5.06E-03	1.00
Total:			5.60	5.60	0.08	10.83	14.39	33.10	2.27	7.16	2.03	3.48E-04	0.17	9.75E-06	1.52E-04	2.76E-04	9.45E-04	8.71E-04	4.18E-05	1.02	2.55E-03	1.12E-04	6.03E-04	8.25E-06	5.06E-03	1.00
Permit Limit (tpy)			14	9	39	39	99	68	9	9	9	9	9	NA	9	9	9	9	9	9	9	9	9	9	9	9

1. Emissions are based on the worst case emission rate for PF or UF resin for each pollutant. Emissions from PF/UF resin production in reactors include PF Resin 5830 emissions, which are calculated separately from the 200,000 tpy PF Resin limit for conservation, and LPE emissions from the reactors. PF/UF resin loading emissions also include PF Resin 5830 emissions. The emission rates for resin production show increases from what was presented in the submitted ACDP renewal application due to a revised calculation methodology to account for multiple reactors.

2. PF, PRF, and UF Resin storage tank emissions represent worst-case emissions assuming 160000 tpy of each respective product. The maximum of UF Resin tank emissions and PF + PRF Resin tank emissions for each pollutant is used.

3. Emissions from triethanolamine storage incorporate both throughput limits for "Triethanolamine Storage" and "Triethanolamine Re Storage".

4. The Fentak process is a separate line from the other dry catalysts processes in Blender 1.

5. Shear Mixer emissions include emissions from all shear mixer storage tanks (RF-300W, FM-6310L, FM-7400L, and Momestive 4720).

6. Hexion refined the calculation methodology for loading emissions to more accurately represent the worst-case vapor speciation and the corresponding pollutant emissions. This update results in an overall decrease in VOC emission rate and slightly increase in methanol emissions.

Table 3: Ammonia Calculations

Component	Vapor Pressure (psia)	Service	SOCMI w/o C ₂ Emission Factors	Equipment Count	Annual Hours of	Emissions				
						(lb/hr)	(tpy)			
Valves	0.47	Light Liquid	0.0035	16	8,760	0.06	0.25			
Flanges/Connectors		Light Liquid	0.0005	36	8,760	0.02	0.08			
Pumps		Light Liquid	0.0386	2	8,760	0.0772	0.338136			
Open-ended Lines		Light Liquid	0.004	4	8,760	0.02	0.07			
Ammonia					29.6%	0.05	0.22	434	lbs/yr	Section 5.1

Antoine Equation --> $\log P_i^s = A - B/(T+C)$, where T - °C and P_i^s - mmHg

Chemical	Antoine's Coefficients			T (°C)	P_i^s (mmHg)	P_i^s (psi)
	A	B	C			
ammonia	7.58743	1013.7815	248.83	20	6552	126.68
Water	8.10765	1750.286	235	20	18	0.34

Wax	Weight %	MW (lb/lbmole)	Moles	Mol%	P_i^s (mmHg)	P_i (mmHg)	P_i (psia)	Light Liquid
Ammonia	29.6%	32.04	0.0092	19.12%	126.68	24.22	0.468	
Water	70.4%	18.01	0.0391	80.88%	0.34	2.74E-01	5.30E-03	
Total							4.74E-01	

Table 4: Tank Emissions

[illegible]

Table 5: Loading Operations Emissions

Material	Throughput (tons)	VOC Emissions	Formaldehyde Emissions ¹	Methanol Emissions ¹	Phenol Emissions ¹	Ethylene Glycol Emissions ¹	Methyl Isobutyl Ketone ¹	Triethylamine ¹	Diethylene Glycol Emissions ¹
		(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)
Formaldehyde Blend Loading									
55/1	3,619	0.18	0.16	0.03	N/A	N/A	N/A	N/A	N/A
UF Resin Loading	160,000	0.41	0.18	0.21	N/A	1.76E-04	N/A	0.02	3.36E-07
PF Resin Loading	160,000	1.45	0.23	0.37	1.32E-02	3.87E-04	4.13E-03	N/A	N/A
Maximum PF/UF Resin Loading	160,000	1.45	0.23	0.37	1.32E-02	3.87E-04	4.13E-03	0.02	3.36E-07
Triazine Loading	17,250	0.25	N/A	0.10	N/A	N/A	N/A	N/A	N/A
Durite LV-1259M Loading	3,375	0.13	9.25E-04	0.08	1.71E-04	7.98E-08	1.28E-04	N/A	N/A
Durite SC-748A Loading	500	6.96E-03	5.45E-05	6.46E-03	3.18E-06	5.51E-09	1.61E-06	N/A	N/A
MF Resin Loading	17,500	0.29	7.80E-04	0.28	N/A	N/A	N/A	N/A	5.51E-08
Catalyst Loading	3,893	1.22E-03	1.13E-03	N/A	N/A	N/A	N/A	N/A	N/A
GN11/8 Loading (MeOH Portion)	0	0.00E+00	N/A	0.00E+00	N/A	N/A	N/A	N/A	N/A

1. Emissions determined by using the emission factor as determined by the Loading Loss Equation 1 from AP-42, Section 5.2.

Table 6: Loading Emission Factors

	Density	Vapor Molecular Weight	Vapor Pressure ¹	Temperature ²	Loading Loss Factor ³	Emission Factor	HCHO Emission Factor ⁴	MeOH Emission Factor ⁴	Phenol Emission Factor ⁴	Ethylene Glycol Emission Factor ⁴	Methyl Isobutyl Ketone Emission Factor ⁴	Triethylamine Emission Factor ⁴	Diethylene Glycol Emission Factor
Material	(lb/gal)	(lb/lb-mol)	(psia)	(R)	(lb emitted /gal loaded)	(lb emitted /lb loaded)	(lb emitted /lb loaded)	(lb emitted /lb loaded)	(lb emitted /lb loaded)	(lb emitted /lb loaded)	(lb emitted /lb loaded)	(lb emitted /lb loaded)	(lb emitted /lb loaded)
Formaldehyde Blend Loading2,5,6													N/A
55/1	9.51	19.94	3.4E+00	609	2.01E-03	2.11E-04	4.29E-05	7.15E-06	N/A	N/A	N/A	N/A	N/A
Formaldehyde		30.03	4.6E-01	609	4.08E-04	4.29E-05							
Methanol		32.05	7.2E-02	609	6.80E-05	7.15E-06							
UF Resin Loading2,7	10.85	19.41	4.5E-01	522	2.77E-05	2.55E-06	1.16E-06	1.33E-06	N/A	1.10E-09	N/A	1.41E-07	2.10E-12
Formaldehyde	N/A	N/A	N/A	522	1.25E-05	1.16E-06	1.16E-06	N/A	N/A	N/A	N/A	N/A	N/A
Methanol	N/A	N/A	N/A	522	1.45E-05	1.33E-06	N/A	1.33E-06	N/A	N/A	N/A	N/A	N/A
Ethylene Glycol	N/A	N/A	N/A	522	1.19E-08	1.10E-09	N/A	N/A	N/A	1.10E-09	N/A	N/A	N/A
Diethylene Glycol	N/A	N/A	N/A	522	2.27E-11	2.10E-12	N/A	N/A	N/A	N/A	N/A	N/A	2.10E-12
2-Ethylhexanol (2EH)	N/A	N/A	N/A	522	1.97E-12	1.81E-13	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Triethylamine	N/A	N/A	N/A	522	1.53E-06	1.41E-07	N/A	N/A	N/A	N/A	N/A	1.41E-07	N/A
Other VOC	N/A	N/A	N/A	522	6.92E-07	6.38E-08	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Triazine	9.17	23.59	3.9E-01	523	1.32E-04	1.44E-05	N/A	5.73E-06	N/A	N/A	N/A	N/A	N/A
Methanol	N/A	N/A	N/A	523	5.26E-05	5.73E-06	N/A	5.73E-06	N/A	N/A	N/A	N/A	N/A
Monoethanolamine	N/A	N/A	N/A	523	7.44E-09	8.11E-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,3,5-Triazine-1,3,5-(2H,4H,6H)-triethanol	N/A	N/A	N/A	523	8.22E-22	8.96E-23	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Durite 1259M Resin Loading2,7	9.18	32.47	8.9E-01	537	3.48E-04	3.79E-05	2.74E-07	2.32E-05	5.06E-08	2.36E-11	3.80E-08	N/A	N/A
Formaldehyde	N/A	N/A	N/A	537	2.52E-06	2.74E-07	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Methanol	N/A	N/A	N/A	537	2.13E-04	2.32E-05	N/A	2.32E-05	N/A	N/A	N/A	N/A	N/A
Phenol8	N/A	N/A	N/A	537	4.64E-07	5.06E-08	N/A	N/A	5.06E-08	N/A	N/A	N/A	N/A
Ethylene Glycol	N/A	N/A	N/A	537	2.17E-10	2.36E-11	N/A	N/A	N/A	2.36E-11	N/A	N/A	N/A
Methyl Isobutyl Ketone	N/A	N/A	N/A	537	3.49E-07	3.80E-08	N/A	N/A	N/A	N/A	3.80E-08	N/A	N/A
Ethanol	N/A	N/A	N/A	537	9.90E-05	1.08E-05	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Resorcinol	N/A	N/A	N/A	537	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other VOC	N/A	N/A	N/A	537	3.28E-05	3.57E-06	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SC-748 Resin Loading2,7	9.93	21.38	5.5E-01	537	1.38E-04	1.39E-05	1.09E-07	1.29E-05	6.36E-09	1.10E-11	3.22E-09	N/A	N/A
Formaldehyde	N/A	N/A	N/A	537	1.08E-06	1.09E-07	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Methanol	N/A	N/A	N/A	537	1.28E-04	1.29E-05	N/A	1.29E-05	N/A	N/A	N/A	N/A	N/A
Phenol8	N/A	N/A	N/A	537	6.32E-08	6.36E-09	N/A	N/A	6.36E-09	N/A	N/A	N/A	N/A
Ethylene Glycol	N/A	N/A	N/A	537	1.09E-10	1.10E-11	N/A	N/A	N/A	1.10E-11	N/A	N/A	N/A
Methyl Isobutyl Ketone	N/A	N/A	N/A	537	3.20E-08	3.22E-09	N/A	N/A	N/A	N/A	3.22E-09	N/A	N/A
Ethanol	N/A	N/A	N/A	537	5.15E-06	5.19E-07	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Resorcinol	N/A	N/A	N/A	537	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other VOC	N/A	N/A	N/A	537	3.59E-06	3.62E-07	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PF Resin Loading2,7	10.26	21.43	4.6E-01	537	9.30E-05	9.06E-06	1.42E-06	2.32E-06	8.24E-08	2.42E-09	2.58E-08	N/A	N/A
Formaldehyde	N/A	N/A	N/A	537	1.46E-05	1.42E-06	1.42E-06	N/A	N/A	N/A	N/A	N/A	N/A
Methanol	N/A	N/A	N/A	537	2.38E-05	2.32E-06	N/A	2.32E-06	N/A	N/A	N/A	N/A	N/A
Phenol8	N/A	N/A	N/A	537	8.45E-07	8.24E-08	N/A	N/A	8.24E-08	N/A	N/A	N/A	N/A
Ethylene Glycol	N/A	N/A	N/A	537	2.48E-08	2.42E-09	N/A	N/A	N/A	2.42E-09	N/A	N/A	N/A
Methyl Isobutyl Ketone	N/A	N/A	N/A	537	2.65E-07	2.58E-08	N/A	N/A	N/A	N/A	2.58E-08	N/A	N/A
Ethanol	N/A	N/A	N/A	537	6.93E-05	6.75E-06	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Resorcinol	N/A	N/A	N/A	537	7.08E-08	6.90E-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other VOC	N/A	N/A	N/A	537	1.14E-06	1.11E-07	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MF Resin Loading2,7	10.51	21.75	6.1E-01	538	1.72E-04	1.64E-05	4.46E-08	1.62E-05	N/A	N/A	N/A	N/A	3.15E-12
Formaldehyde	N/A	N/A	N/A	538	4.68E-07	4.46E-08	4.46E-08	N/A	N/A	N/A	N/A	N/A	N/A
Methanol	N/A	N/A	N/A	538	1.70E-04	1.62E-05	N/A	1.62E-05	N/A	N/A	N/A	N/A	N/A
Diethylene Glycol	N/A	N/A	N/A	538	3.31E-11	3.15E-12	N/A	N/A	N/A	N/A	N/A	N/A	3.15E-12
Other VOC	N/A	N/A	N/A	538	2.02E-06	1.92E-07	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Catalyst Loading	5.84	18.07	0.42	538	1.83E-06	3.14E-07	2.90E-07	N/A	N/A	N/A	N/A	N/A	N/A
Formaldehyde	N/A	N/A	N/A	538	1.70E-06	2.90E-07	2.90E-07	N/A	N/A	N/A	N/A	N/A	N/A
GN11 Loading	10.51	20.42	3.3E-01	546	5.96E-05	5.66E-06	N/A	5.66E-06	N/A	N/A	N/A	N/A	N/A
Glycerin	N/A	N/A	N/A	546	6.24E-17	5.93E-18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Methanol	N/A	N/A	N/A	546	5.96E-05	5.66E-06	N/A	5.66E-06	N/A	N/A	N/A	N/A	N/A

1. The conversion for mmHg to psia is the following: 1 mmHg = 0.019337 psia.

2. UF and PF resins are loaded and stored at 25°C. HCHO blends are loaded at 65°C, the HCHO tank storage temperature. MeOH is also loaded at ambient temperature (44°F per TANKS 4.094).

3. Loading Loss Equation 1 from AP-42, Section 5.2 (June 2008). Durite 1259 and Triazine are submerged loaded. All other liquids are splash loaded; dedicated normal service.

$$L_L = 12.46 \cdot S^{0.75} \cdot P^{0.75} \cdot M / T$$

L_L = loading loss, lb/1000 gal

S = 1.45 saturation factor for splash loading; dedicated normal service

S = 1.00 saturation factor for splash loading; dedicated vapor balance service

S = 0.60 saturation factor for submerged loading; dedicated normal service

P = true vapor pressure of liquid loaded, psia

M = molecular weight of vapors, lb/lb-mol

T = temperature of bulk liquid loaded, R, (°F + 460)

4. The weight fraction of each pollutant was used to speciate loading loss emissions and is calculated according to AP-42, Section 7.1.4, Hazardous Air Pollutants Speciation Methodology, equation 4-1 and 4-6, where L_{wi} is used in place of L_{fi} .

L_{fi} = emission rate for component i, lb/10³ gal

$L_{wi}= Z_{fi} \cdot L_{fi}$

Z_{fi} = weight fraction of component i in the vapor

$Z_{fi} = y_i \cdot M_i / M_v = (P_{vi} / P_o) \cdot (M_i / M_v)$

5. Density and vapor pressure for 55/1 blends are calculated from properties at 65 F.

6. Springfield produces a 53/1 formaldehyde/methanol solution. Solution properties are conservatively calculated assuming a 55/1 formaldehyde/methanol solution.

7. The UF and PP resin specific gravities were obtained from the respective MSDS and SAP.

8. Using Raoult's Law, AP-42 Section 7.1.4, Equation 4-3, September 1997.

P_i = partial pressure of component i, psia

$P_i= P \cdot x_i$

P_i = vapor pressure of pure component i at the daily average liquid surface temperature, psia

x_i = liquid mole fraction, lb-mol/lb-mol

$x_{\text{phenol}}= 0.033$

$x_{\text{methanol}}= 0.028$

9. Methanol specific gravity provided from MSDS and SAP

10. Antoine's equation is used to calculate MeOH vapor pressure per AP-42 7.1 equation 1-25.

11. All the Emission Factors have been updated in the PTE - Pre July file to account for composition updates made while doing the emission calculations.

Table 7: Glycerin Tote Loading Emissions

Emissions Summary

Pollutant	Total Emissions		
	Average (lb/hr)	Maximum (lb/hr)	Annual (tpy)
VOC (including below)	0.00	2.08	0.00
Methanol	0.00	0.02	0.00
Glycerin	0.00E+00	2.06E+00	0.00E+00

Glycerin Emissions

Temperature	86.33 °F	
Annual Loading	0 MMlbs/yr	0
Maximum Loading	1,445 lbs/min	
Specific Gravity	10.51 lbs/gal	

Loading Equation ¹

$L_L = 12.46 \text{ SPM/T}$

Pollutant	Saturation Factor (S) ²	Vapor Pressure (P)	Vapor Mol. Wt. of Glycerin Product (M)	Temp. °R (T)	Uncontrolled Loading Losses (L _L) (lbs/Mgal)	Throughput		Loading Emissions		
						Maximum (gal/hr)	Annual (gal/yr)	Avg. (lb/hr)	Max. (lb/hr)	Annual (tpy)
Glycerin Product	1.45	0.08	90.50	546	2.52E-01	8,250	-	0.00	2.08	0.000
Methanol					2.36E-03	8,250	-	0.00	0.02	0.000
Glycerin					2.49E-01	8,250	-	0.00	2.06	0.00

1. AP-42, Section 5.2.2.1.1, Loading Losses, 7/08

2. AP-42, Section 5.2.2.1.1, Table 5.2-1, 7/08 (splash loading, dedicated normal service).

Table 8: Plant #3 Fugitive Emissions - SOCMI Factors

Component Type	Service	Emission Factor ¹ (lb/hr/comp)	Potential Operating Hours ⁴	Control ²	Weighted Component Count ³				Emissions (lb/yr)				Emissions (tons/yr)				
					HCHO	MeOH	Phenol	ATE	HCHO	MeOH	Phenol	ATE	VOC	HCHO	MeOH	Phenol	ATE
Valves	Gas/Vapor	8.90E-03	8,760	97%	0.175	13.779	0.000	0.000	0.41	32.23	0.00	0.00	0.02	0.00	0.02	N/A	N/A
	Light Liquid	3.50E-03	8,760	97%	1.301	183.959	0.000	0.000	1.20	169.21	0.00	0.00	0.09	0.00	0.08	N/A	N/A
	Light Liquid DTM	3.50E-03	8,760	75%	0.690	17.995	0.000	0.000	5.29	137.93	0.00	0.00	0.07	0.00	0.07	N/A	N/A
	Heavy Liquid	7.00E-04	8,760	30%	111.398	13.380	0.000	0.000	478.16	57.43	0.00	0.00	0.27	0.24	0.029	N/A	N/A
Pump Seals	Light Liquid	3.86E-02	8,760	85%	0.137	7.401	0.000	0.000	6.95	375.38	0.00	0.00	0.19	0.00	0.19	N/A	N/A
	Heavy Liquid	1.61E-02	8,760	30%	4.728	0.826	0.000	0.000	466.77	81.55	0.00	0.00	0.27	0.23	0.041	N/A	N/A
Flanges/Connectors	Gas/Vapor	2.90E-03	8,760	75%	2.055	4.119	0.000	0.000	13.05	26.16	0.00	0.00	0.02	0.01	0.013	N/A	N/A
	Light liquid	5.00E-04	8,760	75%	7.748	744.733	0.000	0.000	8.48	815.48	0.00	0.00	0.41	0.00	0.41	N/A	N/A
	Heavy liquid	7.00E-05	8,760	30%	376.587	57.125	0.000	0.000	161.65	24.52	0.00	0.00	0.09	0.08	0.012	N/A	N/A
Relief Valves	All	2.29E-01	8,760	100%	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	N/A	N/A	N/A	N/A
Total:									1142	1720	0	0	1.43	0.57	0.860	N/A	N/A

1. Factors taken from the TCEQ document *Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives*, dated October 2000. See *SOCMI Without C₂* emission factors in table titled *Uncontrolled*

2. Control efficiencies for 28VHP and 28PI provided in Table V in TCEQ document referenced in Footnote 1. 28VHP program is similar to HON LDAR program as provided in Table III of the same document. The site conducts physical inspections every four (4) hours in the Plant 3 for fugitive leaks as such meeting the weekly inspection requirements of 28PI.

3. The weighted component count is the component count multiplied by the weight fraction of each pollutant in the process stream.

Table 9: Plant #2 Fugitive Emissions - SOCMI Factors

Component Type	Service	Emission Factor ¹ (lb/hr/comp)	Potential Operating Hours ⁴	Control ²	Weighted Component Count ³				Emissions (lb/yr)				Emissions (tons/yr)				
					HCHO	MeOH	Phenol	ATE	HCHO	MeOH	Phenol	ATE	VOC	HCHO	MeOH	Phenol	ATE
Valves	Gas/Vapor	8.90E-03	8,760	97%	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	N/A	N/A	N/A	N/A
	Light Liquid	3.50E-03	8,760	97%	2.071	124.550	0.000	0.000	1.90	114.56	0.00	0.00	0.06	0.00	0.06	N/A	N/A
	Light Liquid DTM	3.50E-03	8,760	75%	0.895	5.005	0.000	0.000	6.86	38.36	0.00	0.00	0.02	0.00	0.02	N/A	N/A
	Heavy Liquid	7.00E-04	8,760	30%	73.432	7.919	0.000	0.000	315.20	33.99	0.00	0.00	0.17	0.16	0.017	N/A	N/A
Pump Seals	Light Liquid	3.86E-02	8,760	85%	0.045	0.935	0.000	0.000	2.28	47.42	0.00	0.00	0.02	0.00	0.02	N/A	N/A
	Heavy Liquid	1.61E-02	8,760	30%	2.998	0.410	0.000	0.000	295.98	40.48	0.00	0.00	0.17	0.15	0.020	N/A	N/A
Flanges/Connectors	Gas/Vapor	2.90E-03	8,760	75%	1.070	9.102	0.000	0.000	6.80	57.81	0.00	0.00	0.03	0.00	0.03	N/A	N/A
	Light liquid	5.00E-04	8,760	75%	14.612	565.185	0.000	0.000	16.00	618.88	0.00	0.00	0.32	0.01	0.31	N/A	N/A
	Heavy liquid	7.00E-05	8,760	30%	251.613	29.422	0.000	0.000	108.00	12.63	0.00	0.00	0.06	0.05	0.006	N/A	N/A
Relief Valves	All	2.29E-01	8,760	100%	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	N/A	N/A	N/A	N/A
Total:									753	964	0	0	0.86	0.38	0.48	N/A	N/A

1. Factors taken from the TCEQ document *Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives*, dated October 2000. See *SOCMI Without C₂* emission factors in table titled *Uncontrolled*

2. Control efficiencies for 28VHP, 28CNTA, 28PI provided in Table V in TCEQ document referenced in Footnote 1. 28VHP and 28 CNTA programs are similar to HON LDAR program as provided in Table III of the same document. The site conducts physical inspections every four (4) hours in the Plant 2 for fugitive leaks as such meeting the weekly inspection requirements of 28PI.

3. The weighted component count is the component count multiplied by the weight fraction of each pollutant in the process stream.

4. Per conversations with Chuck Jacobs in 4/2/2021, lines are never completely empty. As such, 8,760 hours used for calculations.

Table 10: Resin Fugitive Emissions - SOCMI Factors

Component Type	Service	Emission Factor ¹ (lb/hr/comp)	Potential Operating Hours ⁴	Control ²	Weighted Component Count ³					Emissions (lb/yr)					Emissions (tons/yr)					
					HCHO	MeOH	Phenol	ATE	MEA	HCHO	MeOH	Phenol	ATE	MEA	VOC	HCHO	MeOH	Phenol	ATE	MEA
Valves	Gas/Vapor	8.90E-03	8,760	97%	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	N/A	N/A	N/A	N/A	
	Light Liquid	3.50E-03	8,760	97%	0.00	0.00	0.00	24.00		0.00	0.00	0.00	22.08		0.00	N/A	N/A	N/A	0.01	
	Heavy Liquid	7.00E-04	8,760	0%	23.47	13.87	58.92	0.00	10.32	143.94	85.04	361.30	0.00	63.28	0.30	0.07	0.04	0.18	N/A	0.03
Pump Seals	Light Liquid	3.86E-02	8,760	85%	0.00	0.00	0.00	2.00		0.00	0.00	0.00	101.44		0.00	N/A	N/A	N/A	0.05	
	Heavy Liquid	1.61E-02	8,760	0%	1.31	0.74	3.37	0.00	1.04	184.79	104.12	475.97	0.00	146.68	0.38	0.09	0.05	0.24	N/A	0.07
Flanges/Connectors	Gas/Vapor	2.90E-03	8,760	75%	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	N/A	N/A	N/A	N/A	
	Light liquid	5.00E-04	8,760	75%	0.00	0.00	0.00	51.00		0.00	0.00	0.00	55.85		0.03	N/A	N/A	N/A	0.03	
	Heavy liquid	7.00E-05	8,760	0%	48.98	31.98	130.65	0.00	22.80	30.03	19.61	80.12	0.00	13.98	0.06	0.02	0.01	0.04	N/A	0.01
Relief Valves	All	2.29E-01	8,760	100%	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	N/A	N/A	N/A	N/A	
Total:										359	209	917	179	224	0.83	0.18	0.1044	0.46	0.09	0.11

1. Factors taken from the TCEQ document *Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives*, dated October 2000. See *SOCMI Without C₂* emission factors in table titled *Uncontrolled*

2. Control efficiencies for 28VHP and 28CNTA provided in Table V in TCEQ document referenced in Footnote 1. 28VHP and 28CNTA programs are similar to HON LDAR program as provided in Table III of the same document.

3. The weighted component count is the component count multiplied by the weight fraction of each pollutant in the process stream.

4. Per conversations with Chuck Jacobs in 4/2/2021, lines are never completely empty. As such, 8,760 hours used for calculations.

Table 11: Dry Catalyst Emissions

Emission Source	Emission Criteria	Operating Parameter	Operating Parameter Units	Emission Factor	Emission Factor Units	Emissions (ton/yr)
Dry Catalyst Vacuum Sweeper ¹	PM	15.44	MMcf/yr	2.86	lb/MMcf	0.022
Dry Catalyst Plant Blender # 1 & # 3 (Resimine) ¹	PM	411	MMcf/yr	2.86	lb/MMcf	0.587
Dry Catalyst Plant Blender #2 (Para) ¹	PM	561	MMcf/yr	2.86	lb/MMcf	0.801
Dry Catalyst Exhaust Fan (West) ²	PM	18.7	MMcf/yr	0.62	lb/MMcf	0.006
Dry Catalyst Exhaust Fan (South) ²	PM	18.7	MMcf/yr	0.62	lb/MMcf	0.006
Total						1.422

Emission Point	Flowrate (cfm)	Volumetric	
		Operating Hours	MMcf/yr
Blndr#2/Baghse#2/Scrubbr#1	5994	1,560	561
Blndr#3/Blndr#1/Baghse#1 (Resimine)	4396	1,560	411
Vacuum Sweeper	330	780	15

¹Vendors stated design emission rate for baghouse ≤ 0.02 gr/cu.ft. 1.4286×10^{-4} lbs/grain

emission factor = $1.4286\text{E-}04 \times 0.02 \times 1,000,000 =$	2.86	lb/MMcf
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For Area/Bldg Exhaust Fans assume building area dust levels are twice OSHA 8-hr TWA levels for nuisance dust

emission factor = $5 \text{ mg/m}^3 \times 2 = 10 \text{ mg/m}^3 =$	0.624	lb/MMcf
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²Each ventilation fan is exchanging the air from within the building with the outside at a rate of 0.5 changes per hour.

For a 36Mcf building, this value becomes 18Mcf/hr 18000 ft³/hr

Building Operation hours = **2,080** hrs/yr
Volume of air exchanged per year = $18,000\text{scf/hr} \times 2080 \text{ hrs/yr} \times 1 \text{ MMscf/1E-}06 \text{ scf} =$ **37.44** MMcf/yr

There are **two fans** for each 36Mcf building section. Therefore each fan exchanges half of the total air, or **18.72** MMcf/yr

Table 12: Formaldehyde Plant 2 Exhaust Bypass Emissions

Reference for Emission Factors	Units	CO	Total VOC	HCHO	MeOH	Phenol
Formaldehyde Plant 1 - Feed Gas Stack Test ¹	lb/hr	128.4	29.8	0.80	1.10	--

Annual Emission Rates

Formaldehyde Plant Stack	Operating hours (hrs/yr)	CO (TPY)	VOC (TPY)	HCHO (TPY)	MeOH (TPY)	MeOH (TPY)
Formaldehyde Plant Exhaust Bypass	50	3.210	0.745	0.020	0.028	--

1. Stack Test - August 2016, inlet concentration

Table 13: Formaldehyde Plant 3 Exhaust Bypass Emissions

Reference for Emission Factors	Units	CO	Total VOC	HCHO	MeOH	Phenol
Formaldehyde Plant 1 - Feed Gas Stack Test ¹	lb/hr	108.5	57.1	4.50	8.10	--

Annual Emission Rates

Formaldehyde Plant Stack	Operating hours (hrs/yr)	CO (TPY)	VOC (TPY)	HCHO (TPY)	MeOH (TPY)	MeOH (TPY)
Formaldehyde Plant Exhaust Bypass	54	2.930	1.542	0.122	0.219	--

1. Stack Test - August 2016, inlet concentration

Table 14: Johnston Boiler Tail Gas Combustion Emissions

Source: Johnston Boiler

Emission Calculations using Johnston Boiler test data, August 2016

<i>Annual Hours of Operation</i>
8760

<i>Component</i>	<i>Tail Gas Combustion Factor²</i>	<i>Johnston Boiler Annual Emissions¹</i>
	<i>(lb/hr)</i>	<i>(tpy)</i>
NO _x	0.146	0.64
CO	0.05	0.23
Total VOC	0.01	0.05
Formaldehyde	0.001	0.00
Methanol	0.003	0.01
CO ₂ e	254	1,113

1. Annual emissions (tpy) = Average emissions (lb/hr) * Annual Hours of Operation (hr/yr) / Conversion Factor (lb/ton)

2. A safety factor of 2 is applied for conservatism.

Tail Gas Combustion Factors

Tail Gas Combustion ¹ Factor (lb/hr)	NO _x	CO	VOC	HCHO	MeOH
	0.07	0.03	0.01	0.00030	0.0015

1. Johnston Boiler Stack Test - August 2016 based on outlet concentration test results.

Table 15: Erie Boiler Waste Tail Gas Emissions

NAME	Erie Boiler		
COMBUSTION DATA			
TAIL GAS OPERATING HOURS ¹ -		8,760 hr/yr	
EMISSIONS		TPY ²	
NOx		0.41	
CO		0.08	
VOC		0.04	
Formaldehyde		6.04E-04	
Methanol		7.27E-03	
CALCULATIONS			
Emissions (ton/yr) = Factor (lb/hr) x Operating Hours (hr/yr) / 2000 (lb/ton)			

¹ The Erie Boiler only combusts tail gas during startups. Per email from Chuck Jacobs on November 5, 2019.

Tail Gas Combustion ¹	NOx	CO	VOC	HCHO	MeOH	CO ₂ e
Factor (lb/hr)	0.05	0.01	0.00	0.00007	0.00083	245

1. Stack Test - August 2016

2. A safety factor of 2 is applied for conservatism.

Tail Gas Combustion ¹²	NOx	CO	VOC	HCHO	MeOH
Factor (lb/hr)	0.03	0.62	0.43	0.00608	0.00576

1. Stack Test - April 2010

Table 16: Emergency Diesel Generator

Emission Factors

CAS or DEQ ID	Pollutant Name	Controlled EF?	Control Efficiency	EF Values	Units	EF Reference/Notes
71-43-2	Benzene	N	0.00%	0.1863	lb/M gal	SCAQMD AB2588 B-2
106-99-0	1,3-Butadiene	N	0.00%	0.2174	lb/M gal	SCAQMD AB2588 B-2
7440-43-9	Cadmium and compounds	N	0.00%	0.0015	lb/M gal	SCAQMD AB2588 B-2
50-00-0	Formaldehyde	N	0.00%	1.7261	lb/M gal	SCAQMD AB2588 B-2
18540-29-9	Chromium VI, chromate and dichromate particulate	N	0.00%	0.0001	lb/M gal	SCAQMD AB2588 B-2
7440-38-2	Arsenic and compounds	N	0.00%	0.0016	lb/M gal	SCAQMD AB2588 B-2
7439-92-1	Lead and compounds	N	0.00%	0.0083	lb/M gal	SCAQMD AB2588 B-2
365	Nickel compounds, insoluble	N	0.00%	0.0039	lb/M gal	SCAQMD AB2588 B-2
91-20-3	Naphthalene	N	0.00%	0.0197	lb/M gal	SCAQMD AB2588 B-2
401	Polycyclic aromatic hydrocarbons (PAHs)	N	0.00%	3.62E-02	lb/M gal	SCAQMD AB2588 B-2
50-32-8	Benzo[a]pyrene	N	0.00%	3.55E-05	lb/M gal	AP-42 Table 3.4-4
75-07-0	Acetaldehyde	N	0.00%	0.7833	lb/M gal	SCAQMD AB2588 B-2
107-02-8	Acrolein	N	0.00%	0.0339	lb/M gal	SCAQMD AB2588 B-2
7664-41-7	Ammonia	N	0.00%	0.8	lb/M gal	SCAQMD AB2588 B-2
7440-50-8	Copper and compounds	N	0.00%	0.0041	lb/M gal	SCAQMD AB2588 B-2
100-41-4	Ethyl benzene	N	0.00%	0.0109	lb/M gal	SCAQMD AB2588 B-2
110-54-3	Hexane	N	0.00%	0.0269	lb/M gal	SCAQMD AB2588 B-2
7647-01-0	Hydrochloric acid	N	0.00%	0.1863	lb/M gal	SCAQMD AB2588 B-2
7439-96-5	Manganese and compounds	N	0.00%	0.0031	lb/M gal	SCAQMD AB2588 B-2
7439-97-6	Mercury and compounds	N	0.00%	0.002	lb/M gal	SCAQMD AB2588 B-2
7782-49-2	Selenium and compounds	N	0.00%	0.0022	lb/M gal	SCAQMD AB2588 B-2
108-88-3	Toluene	N	0.00%	0.1054	lb/M gal	SCAQMD AB2588 B-2
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	N	0.00%	0.0424	lb/M gal	SCAQMD AB2588 B-2
200	Diesel particulate matter	N	0.00%	33.5	lb/M gal	SCAQMD AB2588 B-2

¹ No SCR or SCNR so an emission factor of 0.8 lb/M use per Oregon DEQ FAQ guidance on Diesel Generator emissions.

Emissions

CAS or DEQ ID	Pollutant Name	Fuel Usage ¹	Hours of Operation Per Day ²	Hours Of Operation Per Year ²	Cold Start Emission Factor Method ³	Daily Emissions	Annual Emissions
71-43-2	Benzene	53.33	1	30	PM and Organics	1.05E-02	0.33
106-99-0	1,3-Butadiene	53.33	1	30	PM and Organics	1.22E-02	0.38
7440-43-9	Cadmium and compounds	53.33	1	30	NA	8.00E-05	0.00
50-00-0	Formaldehyde	53.33	1	30	CO and Formaldehyde	9.79E-02	3.07
18540-29-9	Chromium VI, chromate and dichromate particulate	53.33	1	30	NA	5.33E-06	0.00
7440-38-2	Arsenic and compounds	53.33	1	30	NA	8.53E-05	0.00
7439-92-1	Lead and compounds	53.33	1	30	NA	4.43E-04	0.01
365	Nickel compounds, insoluble	53.33	1	30	NA	2.08E-04	0.01
91-20-3	Naphthalene	53.33	1	30	PM and Organics	1.11E-03	0.03
401	Polycyclic aromatic hydrocarbons (PAHs) ⁴	53.33	1	30	PM and Organics	2.03E-03	0.06
50-32-8	Benzo[a]pyrene	53.33	1	30	PM and Organics	2.00E-06	0.00
75-07-0	Acetaldehyde	53.33	1	30	PM and Organics	4.40E-02	1.37
107-02-8	Acrolein	53.33	1	30	PM and Organics	1.91E-03	0.06
7664-41-7	Ammonia	53.33	1	30	NA	4.27E-02	1.28
7440-50-8	Copper and compounds	53.33	1	30	NA	2.19E-04	0.01
100-41-4	Ethyl benzene	53.33	1	30	PM and Organics	6.13E-04	0.02
110-54-3	Hexane	53.33	1	30	PM and Organics	1.51E-03	0.05
7647-01-0	Hydrochloric acid	53.33	1	30	PM and Organics	1.05E-02	0.33
7439-96-5	Manganese and compounds	53.33	1	30	NA	1.65E-04	0.00
7439-97-6	Mercury and compounds	53.33	1	30	NA	1.07E-04	0.00
7782-49-2	Selenium and compounds	53.33	1	30	NA	1.17E-04	0.00
108-88-3	Toluene	53.33	1	30	PM and Organics	5.93E-03	0.18
1330-20-7	Xylene (mixture), including m-xylene, o-xylene, p-xylene	53.33	1	30	PM and Organics	2.38E-03	0.07
200	Diesel particulate matter	53.33	1	30	PM and Organics	1.88E+00	58.65

¹ Max Diesel Fuel compustion of generator per historic calcuations is:

53.325 gal/hr

² Per discussion with Chuck Jacobs on 11/16/2021 the diesel generator is operated ~30min per week so it is assumed:

Maximum of 1 hr/day
Maximum of 30 hrs/yr

³ Spike duration, cold-start emission spike, and steady-state (warm) emissions based on data from California Energy Commission (CEC) "Air Quality Implications of Backup Generators in California". The cold-start scaling factor is derived as the ratio of the spike concentration and duration to the steady-state emissions for the initial 60 seconds. Since a cold-start curve was not developed by CEC, it is assumed that the PM will experience the same trend as HC, and formaldehyde will experience the same trend as CO. A cold start event assumes 1 minute of cold start operation with spike in emissions and the remaining 59 minutes in the hour operating steady state. The cold start emission ratio shown below on hourly basis will be applied as: the hourly emission rate with cold start event = normal hourly emission rate x (1+ratio shown below on hourly basis). Consistent with DEQ's guidance on risk assessment for emergency engines, the cold start emissions are accounted for toxics that are organics and DPM. Metal toxics do not have higher emissions during cold start events. The facility has assumed weekly operation for determination of cold starts/period.

Pollutant	Spike Duration (seconds)	Cold-Start Emission Spike (ppm)	Steady-State (Warm) Emissions (ppm)	Cold-Start Scaling Factor	Cold Start Emission Ratio on Hourly Basis	Cold Starts/Day	Cold Starts/yr
PM and Organics	14	900	30	4.27	0.05	1.00	52.00
CO and Formaldehyde	20	750	30	4.83	0.06	1.00	52.00

⁴ For PAH emissions present above, emissions from Benzo[a]pyrene were removed from the aggregate PAH emissions and presented as individual pollutant emissions to apply pollutant specific RBCs. Additionally, naphthalene emissions are typically part of PAH, but are removed in the PAH emissions presented above as well.

Table 17: Blender 1 VOC Emissions - Catalyst Plant

Product	Formaldehyde	Hexamethylenetetramine	Ethylene Oxide	1,4-Dioxane	Other VOCs ⁽¹⁾	Polyethylene Glycol ⁽¹⁾	Glycol Ether	Max Production (lbs) based on Batch Size and Batch Time
	Calculated Emissions (lb/yr) for each product if produced all year							lb/yr
Perkins DS-200	0.27	9.13E-04	1.83E-04	2.97E-05	0.22	2.78E-06	2.11E-04	7,786,667
Perkins DS-201	0.25	6.82E-04	N/A	N/A	0.20	N/A	N/A	7,170,043
Perkins DS-202	0.27	1.25E-03	2.81E-04	4.55E-05	0.23	4.26E-06	3.24E-04	7,786,667
Perkins DS-203	0.21	9.61E-04	N/A	N/A	0.19	N/A	N/A	5,948,056
Perkins MS-406	0.24	N/A	N/A	N/A	0.19	N/A	N/A	8,122,392
Cascamite CM-12S	0.24	N/A	N/A	N/A	0.01	N/A	N/A	6,905,794
Cascomel MF-216S	0.12	N/A	N/A	N/A	0.0008	N/A	N/A	14,016,000
Cascomel MF-212B	0.20	N/A	N/A	N/A	0.002	N/A	N/A	19,841,400
Cascamite TS-44S(CO)	0.24	N/A	N/A	N/A	0.07	N/A	N/A	6,810,496
Worst Case Emissions from Products Above (lb/yr)	0.27	1.25E-03	2.81E-04	4.55E-05	0.23	4.26E-06	3.24E-04	7,786,667
tons per year	1.36E-04	6.23E-07	1.41E-07	2.28E-08	1.17E-04	2.13E-09	1.62E-07	3893

Note: (1) - These emissions will cover Blender 3 as well

Table 18: Blender 1 VOC Emissions - Fentak

	Step1	Step 1	Step 1	Step 1	Step 1	Step 1
	WATER	Sodium Alginate	Aerosol A22	FC-414 Antifoam	Mica D325W	Vessel Displacement
	Vapor Displacement	Vapor Displacement	Vapor Displacement	Vapor Displacement	Vapor Displacement	Vapor Displacement
	(Mass Based)	(Mass Based)	(Mass Based)	(Mass Based)	(Mass Based)	(Mass Based)
Inputs						
Chemical 1	Water	Water	Water	Water	Water	Water
Chemical 2		Solids	Solids	Solids	Solids	Solids
Chemical 3			Ethanol	Ethanol	Ethanol	Ethanol
Chemical 4				Mineral Spirits	Mineral Spirits	Mineral Spirits
Amount of Chemical 1 (kgs)	9.20	9.20	133.61	133.61	133.61	133.61
Amount of Chemical 2 (kgs)		648.38	724.29	724.29	1607.58	1607.58
Amount of Chemical 3 (kgs)			10.54	10.54	10.54	10.54
Amount of Chemical 4 (kgs)				62.63	62.63	62.63
Initial Temperature of Vessel Vapor Space in oC (T1)	25	25	25	25	25	25
Total Volume of New Chemicals Added (liters)	9.20	648.38	213.67	79.28	883.28	1833.81
Calculations						
T* in K						
VP of Chemical 1 (Pa) at T1	3171.710636	3171.710636	3171.710636	3171.710636	3171.710636	3171.710636
VP of Chemical 2 (Pa) at T1	0	0	0	0	0	0
VP of Chemical 3 (Pa) at T1	0	0	7927.721194	7927.721194	7927.721194	7927.721194
VP of Chemical 4 (Pa) at T1	0	0	0	181.0042905	181.0042905	181.0042905
Liquid Phase Mol. Fr. for Chemical 1 (kmol/kmol)	1.00	0.16	0.70	0.68	0.51	0.51
Liquid Phase Mol. Fr. for Chemical 2 (kmol/kmol)	0.00	0.84	0.27	0.26	0.44	0.44
Liquid Phase Mol. Fr. for Chemical 3 (kmol/kmol)	0.00	0.00	0.02	0.02	0.02	0.02
Liquid Phase Mol. Fr. for Chemical 4 (kmol/kmol)	0.00	0.00	0.00	0.04	0.03	0.03
Partial Pressure of Chemical 1 (Pa) at T1	3171.71	521.71	2231.22	2141.79	1620.47	1620.47
Partial Pressure of Chemical 2 (Pa) at T1	0.00	0.00	0.00	0.00	0.00	0.00
Partial Pressure of Chemical 3 (Pa) at T1	0.00	0.00	172.10	165.20	124.99	124.99
Partial Pressure of Chemical 4 (Pa) at T1	0.00	0.00	0.00	7.25	5.49	5.49
Volume of Gas Displaced From Vessel (m3)	0.01	0.65	0.21	0.08	0.88	1.83
Emissions						
Emissions of Chemical 1 (kg)	0.000212076	0.002458809	0.003465344	0.00123427	0.010404159	0.021600356
Emissions of Chemical 2 (kg)	0	0	0	0	0	0
Emissions of Chemical 3 (kg)	0	0	0.000683501	0.000243446	0.002052107	0.004260435
Emissions of Chemical 4 (kg)	0	0	0	3.3019E-05	0.00027833	0.000577849
Is Chemical 1 a HAP?	No	No	No	No	No	No
Is Chemical 2 a HAP?		No	No	No	No	No
Is Chemical 3 a HAP?			No	No	No	No
Is Chemical 4 a HAP?				No	No	No
Is Chemical 1 a VOC?	No	No	No	No	No	No
Is Chemical 2 a VOC?		No	No	No	No	No
Is Chemical 3 a VOC?			Yes	Yes	Yes	Yes
Is Chemical 4 a VOC?				Yes	Yes	Yes
Final Results						
Chemical 1 (kg)	0.000212076	0.002458809	0.003465344	0.00123427	0.010404159	0.021600356
Chemical 2 (kg)	0	0	0	0	0	0
Chemical 3 (kg)	0	0	0.000683501	0.000243446	0.002052107	0.004260435
Chemical 4 (kg)	0	0	0	3.3019E-05	0.00027833	0.000577849
Total HAP Emissions (kg)	0	0	0	0	0	0
Total VOC Emissions (kg)	0	0	0.000683501	0.000276465	0.002330438	0.004838285

Pollutant	Estimated Emissions (lb/batch)	Estimated Emissions (lb/hr)	Batches per Year (PTE = 1726)	Estimated Total Emissions (lb/yr)	Estimated Total Emissions with 10% Safety Factor (lb/yr)
Water	0.087	0.0098	1726	149.83	164.81
Solids	0.000	0.0000	1726	0.00	0.00
Ethanol	0.016	0.0018	1726	27.55	30.30
Mineral Spirits	0.002	0.0002	1726	3.38	3.72

Note: Assumed batch size of 4,000 lbs, batch time is 4.89 hr.

Table 19: Blender 2 - Dry Catalyst Scrubber - Formaldehyde Emissions

	Scrubber	Blower Flowrate (cfm)	Scrubber Water (wt% Formaldehyde)	Formaldehyde Vapor Concentration (HCHO ppmv) ^a	Formaldehyde Emissions (lbs/hr) ^b	Blower Operations (hrs/yr)	Total Annual Formaldehyde Emissions (lbs)	Total Annual Formaldehyde Emissions (tpy)
Blender 2	Scrubber #1	5994	0.5	13.1	0.39	1560	615.02	0.31

^a MeOH Model (MeOHppmv)

^b Formaldehyde emissions based on an ideal gas and with the following

Molar Mass 30.026 g/mol

Conversion of 453.592 g/lb

Ideal gas

molar density 22.4 L/mol

Conversion of 28.3168 L/ft³

Table 20: Blender 2 - 5807

VOC Emission Calculations	Step 4	Step 5	Step 6	Step 7
	Add Malic Acid to Blender 2	Add Reax 83A to Blender 2	Add Blandol White Mineral Oil to Blender 2	Displace to Bags
	Vapor Displacement (Mass Based)	Vapor Displacement (Mass Based)	Vapor Displacement (Mass Based)	Vapor Displacement (Mass Based)
Inputs				
Chemical 1	Water	Water	Water	Water
Chemical 2	Solids	Solids	Solids	Solids
Chemical 3	Formaldehyde	Formaldehyde	Formaldehyde	Formaldehyde
Chemical 4	Malic Acid	Malic Acid	Malic Acid	Malic Acid
Chemical 5			Mineral Oil	Mineral Oil
Amount of Chemical 1 (kgs)	100.66	100.66	100.66	100.66
Amount of Chemical 2 (kgs)	5168.64	5223.07	5223.07	5223.07
Amount of Chemical 3 (kgs)	70.47	70.47	70.47	70.47
Initial Temperature of Vessel Vapor Space in °C (T1)	25.00	25.00	25.00	25.00
Total Volume of New Chemicals Added (liters)	13.60	54.43	68.90	5492.69
VP of Chemical 1 (Pa) at T1	3.17E+03	3.17E+03	3.17E+03	3.17E+03
VP of Chemical 2 (Pa) at T1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
VP of Chemical 3 (Pa) at T1	1.18E+02	1.18E+02	1.18E+02	1.18E+02
VP of Chemical 4 (Pa) at T1	1.33E+01	1.33E+01	1.33E+01	1.33E+01
VP of Chemical 5 (Pa) at T1	0.00E+00	0.00E+00	1.33E+00	1.33E+00
Liquid Phase Mol. Fr. for Chemical 1 (kmol/kmol)	0.19	0.19	0.18	0.18
Liquid Phase Mol. Fr. for Chemical 2 (kmol/kmol)	0.72	0.72	0.67	0.67
Liquid Phase Mol. Fr. for Chemical 3 (kmol/kmol)	0.08	0.08	0.08	0.08
Liquid Phase Mol. Fr. for Chemical 4 (kmol/kmol)	0.01	0.01	0.01	0.01
Liquid Phase Mol. Fr. for Chemical 5 (kmol/kmol)	0.00	0.00	0.07	0.07
Partial Pressure of Chemical 1 (Pa) at T1	6.16E+02	6.11E+02	5.67E+02	5.67E+02
Partial Pressure of Chemical 2 (Pa) at T1	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Partial Pressure of Chemical 3 (Pa) at T1	9.62E+00	9.55E+00	8.85E+00	8.85E+00
Partial Pressure of Chemical 4 (Pa) at T1	7.52E-02	7.47E-02	6.93E-02	6.93E-02
Partial Pressure of Chemical 5 (Pa) at T1	0.00E+00	0.00E+00	9.67E-02	9.67E-02
Volume of Gas Displaced From Vessel (m ³)	1.36E-02	5.44E-02	6.26E-02	5.49E+00
Emissions of Chemical 1 (kg)	6.09E-05	2.42E-04	2.58E-04	2.26E-02
Emissions of Chemical 2 (kg)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Emissions of Chemical 3 (kg)	1.58E-06	6.29E-06	6.71E-06	5.88E-04
Emissions of Chemical 4 (kg)	5.54E-08	2.20E-07	2.34E-07	2.06E-05
Emissions of Chemical 5 (kg)	0.00E+00	0.00E+00	5.86E-08	5.14E-06

EMISSION SUMMARY

Pollutant	Estimated Emissions (lb/batch)	Estimated Emissions (lb/hr)	Hours per Year (Permi Basis = 1560)	Estimated Total Emissions (lb/yr)	Safety Factor	Requested Total Emissions (lb/yr)	Requested Total Emissions (TPY)	Comments
Water	N/A	N/A	N/A	N/A	N/A	N/A		
Solids	N/A	N/A	N/A	N/A	N/A	N/A		
Formaldehyde	3.16E-03	7.90E-04	1560	1.23	10	12.32		Emissions are captured in Table 28
Malic Acid (Non-HAP VOC)	4.64E-05	1.16E-05	1560	0.02	10	0.18	9.06E-05	
Mineral Oil (Non-HAP VOC)	1.15E-05	2.86E-06	1560	0.004	10	0.045	2.23E-05	

Note: Batch size of 12,000 lbs. This source is permitted for 1560 hours in existing permit basis

Table 21: Reactor Production/Operation Information

Resin Category	Family	Product(s)	Reactor	Maximum Batch Size (lbs)	Maximum Batch Time (Hours)	Average Batch Size (lbs)	Average Batch Time (Hours)	Vacuum Data (Avg.DSCFM)*	Vacuum Operation (hrs)
PF Resins	PRF	LT-5210D, LT-5210J, G-1181G, AG-5545D	#5, #8, #4	146,000	29	35,000	10	112	4
	PF Plywood	335J, 318G, 3CA34G, IB165B	#4,#5, #8	143,000	7	141,000	7	150	4
	Specialty Resins	PF HX-501, PF XCOUR-6, RF-300W, RF-5445S	#4,#5, #8	22,000	28	12,000	22		4
UF Resins	UF Particleboard	C23WS, RL93F, W132D	#6, #7, #8	180,000	9	153,000	9	90	4
	UF Fertilizer	Methylene Urea 28-0-0	#6, #7, #8	65,000	8	65,000	7		4
	UF Hardwood Plywood	LF571, LF551, CR583	#6, #7, #8	145,000	15	120,000	12		4
	Glass Mat	FG-115E, FG486	#6, #7	52,000	9	38,000	8	90	4
	Catalyst Modifiers	Q-55BC	#6, #7, #8	53,000	8	51,000	7		4
	Sugar Acetone/Ketone	WB-2527, KF-70	#7,#9	33,000	15	30,000	11	135	4
MF Resins	Methylated Melamines	MF-1L, MF-2L, LOM20, L-4345B, L-4305	#9, #8	53,000	19	41,000	10	149	4
	Saturating Melamines	707X	#9	51,000	6	49,000	6	95	4
	Methylated X	SC-748A, LV1259M	#5	30,000	16	30,000	10		4

* Test data or process data

	2006			
Equipment Utilization	(lbs)	(Hours)	Average Prod. Rate (lbs/hr)	Average Batch Time (Hrs)
R-4	97,163,138	5,151		7.69
R-5	47,527,432	5101		16
R-8 PF	2,466,056	1799.52		9
Total	147,156,626	12,051	12,211	
R-6	103,379,463	5,533		8
R-7	30,120,258	1,700		8
R-8 UF	167,413	147		35
Total	133,667,134	7,380	18,113	
R-9	24,830,030	3,503		6
Total	24,830,030	3,503	7,088	

	2007			
Equipment Utilization	(lbs)	(Hours)	Average Prod. Rate (lbs/hr)	Average Batch Time (Hrs)
R-4	105,847,065	5,711		7.8
R-5	43,769,159	5037.07		17
R-8 PF	2,359,069	1691.69		9
Total	151,975,293	12,440	12,217	
R-6	97,073,794	5,218		8
R-7	18,766,561	1,204		9
R-8 UF	208,550	183		35
Total	116,048,905	6,605	17,569	
R-9	23,367,232	3,093		6
Total	23,367,232	3,093	7,554	

	2008			
Equipment Utilization	(lbs)	(Hours)	Average Prod. Rate (lbs/hr)	Average Batch Time (Hrs)
R-4	85,755,870	4,725		8
R-5	27,335,659	4228.64		22
R-8 PF	1,999,931	1528.54		9
Total	115,091,460	10,482	10,980	
R-6	76,215,836	4,530		9
R-7	13,294,351	961		10
R-8 UF	490,705	395		32
Total	90,000,892	5,886	15,289	
R-9	22,682,917	3,044		6
Total	22,682,917	3,044	7,452	

	2009			
Equipment Utilization	(lbs)	(Hours)	Average Prod. Rate (lbs/hr)	Average Batch Time (Hrs)
R-4	33,482,931	1,734		8
R-5	56,970,647	4870.7		12
R-8 PF	1,605,450	1243.37		9
Total	92,059,028	7,848	11,730	
R-6	65,810,530	3,861		9
R-7	9,956,923	735		11
R-8 UF	496,476	413		33
Total	76,263,929	5,008	15,227	
R-9	10,452,664	1,380		6
Total	10,452,664	1,380	7,576	

	2010			
Equipment Utilization	(lbs)	(Hours)	Average Prod. Rate (lbs/hr)	Average Batch Time (Hrs)
R-4	54,472,820	3,030		8
R-5	53,148,767	4871.49		13
R-8 PF	1,498,935	1130.03		9
Total	109,120,522	9,032	12,082	
R-6	56,372,560	3,527		9
R-7	16,368,364	1,219		11
R-8 UF	741,321	567		31
Total	73,482,245	5,313	13,832	
R-9	10,185,224	1,394		6
Total	10,185,224	1,394	7,305	

Table 22: Suggested Factors for Plant Seal Water Vapor

Constituent	Temp	Concentration ^a			
		H2O	0.5 LPM	5.0 LPM	0.5 LPM
MeOH	10	550	636.2	511.3	661
	15	839	784.5	796.3	767
	25	1269	1213.9	1311.5	1316
DMM	10	7144	7144	2668.7	
	15	9137	9136.9	5843.6	
	25	11038	11037.9	7009.2	
Phenol	10	1.6	1.6	1	15.3
	15	1.7	1.7	1.4	20.6
	25	1.8	1.8	2.1	29
HCHO	10	51	50.5	29	34.6
	15	54	53.9	46.8	32.7
	25	81	80.5	75.5	51.3

^a Per October 30, 2001 scrubber study.

Table 23: Annual Resin Reactor Formaldehyde Scrubber Emission:

Resin Category	Family	Product(s)	Reactor	Average Flowrate to Scrubber (CFM) ^a	Flowrate (DSCFM) ^b	Scrubber Water (wt% Formaldehyde)	Conversion Factor (ppmv/wt%)	Scrubber Water Temperature Basis (F/C)	HCHO Vapor Concentration (Formaldehyde ppmv) ^c	Formaldehyde Emissions (lbs/hr) ^f	Batch Time hrs/Batch	No. of Batches/Yr	% Vacuum Operation	Total Annual Formaldehyde Emissions (lbs)
PF Resins	PRF	LT-5210D, LT-5210J, G-1181G, AG-5545D	#5, #8, #4	112	109	0.5	54	59/15	27	0.013745793	10	174	60	14.35
	PF Plywood	335J, 318G, 3CA34G, IB165B	#4, #5, #8	150	146	0.5	54	59/15	27	0.018409544	7	23	86	2.54
	Specialty Resins	PF HX-501, PF XCOUR-6, RF-300W, RF-5445S	#4, #5, #8	93	90	0.5	54	59/15	27	0.011413917	22	5	27	0.34
UF Resins	UF Particleboard	C23WS, RL93F, W132D	#6, #7, #8	93	90	0.5	54	59/15	27	0.011413917	9	438	56	25.00
	UF Fertilizer	Methylene Urea 28-0-0	#6, #7, #8	93	90	0.5	54	59/15	27	0.011413917	7	5	71	0.29
	UF Hardwood Plywood	LF571, LF551, CR583	#6, #7, #8	93	90	0.5	54	59/15	27	0.011413917	12	221	42	12.61
	Glass Mat	FG-115E, FG486	#6, #7	93	90	0.5	54	59/15	27	0.011413917	8	10	63	0.57
	Catalyst Modifiers	Q-55BC	#6, #7, #8	93	90	0.5	54	59/15	27	0.011413917	7	16	n/a	n/a
	Sugar Acetone/Ketone	WB-2527, KF-70	#7, #9	93	90	0.5	54	59/15	27	0.011413917	11	2	18	0.05
MF Resins	Methylated Melamines	MF-1L, MF-2L, LOM20, L-4345B, L-4305	#9, #8	149	145	0.5	54	59/15	25.5	0.01727088	10	480	60	49.74
	Saturating Melamines	707X	#9	95	92	0.5	54	59/15	25.5	0.011011635	7	21	86	1.39
	Methylated X	SC-748A, LV1259M	#5	112	109	0.5	54	59/15	25.5	0.012982138	10	20	60	1.56

max hourly production rate				Thruput limits			
12,217 lbs/hr				3.20E+08			
18,113 lbs/hr				3.20E+08			
				26194 hrs for reactors 4,5 and 8			
				0 hrs for reactors 6, 7 and 9			
				413 lbs for PF Resin Emissions			
				0 lbs for UF Resin Emissions			
				413 lbs for Max PF/UF Resin Emissions			
				68 lbs for MF Resin Emissions			
				482 total emissions from resin production			

Note(s):
^a See Scrubber Data Sheets
^b Air Stream Moisture Content correction
^c MeOH Model (MeOHppmv)

^d The hours of operation per year are calculated by dividing the permitting resin limit by the maximum hourly production rate. Reactors 4, 5 and 8 are used for PF resin production and Reactors 6, 7 and 8 are used for UF resin production. Running three reactors at the maximum hourly production rate continuously will not reach the permitted resin production limit. Therefore, the emissions are calculated assuming the PF resin will reach the maximum production rate based on the physical capacity and the UF production rate will be the remaining from the permitted limit, since PF resin production has a higher formaldehyde emission rate.
^e Formaldehyde emissions based on an ideal gas and with the following
Molar Mass 30.026 g/mol
Conversion of 453.592 g/lb
Ideal gas molar density @ 20 C 24 L/mol
Conversion of 28.3168 L/ft³

Table 24: Annual Resin Reactor Methanol Scrubber Emissions

Resin Category	Family	Product(s)	Reactor	Average Flowrate to Scrubber (CFM) ^a	Flowrate (DSCFM) ^b	Scrubber Water (wt% Methanol)	Conversion Factor (ppmv/wt%)	Scrubber Water Temperature Basis (F/C)	Methanol Vapor Concentration (Methanol ppmv) ^c	Methanol Emissions (lbs/hr) ^a	Batch Time hrs/Batch	No. of Batches/Yr	% Vacuum Operation	Total Annual Methanol Emissions (lbs)
PF Resins	PRF	LT-5210D, LT-5210J, G-1181G, AG-5545D	#5, #8, #4	112	109	0.25	839	59/15	209.75	0.113947035	10	174	60.0	118.96
	PF Plywood	335J, 318G, 3CA34G, IB165B	#4, #5, #8	150	146	0.25	839	59/15	209.75	0.152607636	7	23	85.7	21.06
	Specialty Resins	PF HX-501, PF XCOUR-6, RF-300W, RF-5445S	#4, #5, #8	93	90	0.25	839	59/15	209.75	0.094616735	22	5	27.3	2.84
UF Resins	UF Particleboard	C23WS, RL93F, W132D	#6, #7, #8	93	90	0.25	839	59/15	209.75	0.094616735	9	438	55.6	207.21
	UF Fertilizer	Methylene Urea 28-0-0	#6, #7, #8	93	90	0.25	839	59/15	209.75	0.094616735	7	5	71.4	2.37
	UF Hardwood Plywood	LF571, LF551, CR583	#6, #7, #8	93	90	0.25	839	59/15	209.75	0.094616735	12	221	41.7	104.55
	Glass Mat	FG-115E, FG486	#6, #7	93	90	0.25	839	59/15	209.75	0.094616735	8	10	62.5	4.73
	Catalyst Modifiers	Q-55BC	#6, #7, #8	93	90	0.25	839	59/15	209.75	0.094616735	7	16	n/a	n/a
	Sugar Acetone/Ketone	WB-2527, KF-70	#7, #9	93	90	0.25	839	59/15	209.75	0.094616735	11	2	18.2	0.38
MF Resins	Methylated Melamines	MF-1L, MF-2L, LOM20, L-4345B, L-4305	#9, #8	149	145	0.25	839	59/15	209.75	0.151590252	10	480	60.0	436.58
	Saturating Melamines	707X	#9	95	92	0.25	839	59/15	209.75	0.096651503	7	21	85.7	12.18
	Methylated X	SC-748A, LV1259M	#5	112	109	0.25	839	59/15	209.75	0.113947035	10	20	60.0	13.67

max hourly production rate				Thruput limits		Hours of Operation per Year ^d		Permitted Methanol Emissions	
12,217 lbs/hr				PF Total lbs		3,20E+08		3426 lbs for PF Resin Emissions	
18,113 lbs/hr				UF Total lbs		3,20E+08		0 lbs for UF Resin Emissions	
				Maximum of PF/UF (lbs)		3,20E+08		3426 lbs for Max PF/UF Resin Emissions	
7,576 lbs/hr				MF Total lbs		3,50E+07		600 lbs for MF Resin Emissions	
								4027 total emissions from resin production	

Note(s):

^a See Scrubber Data Sheets

^b Air Stream Moisture Content correction

^c MeOH Model (MeOHppmv)

^d The hours of operation per year are calculated by dividing the permitting resin limit by the maximum hourly production rate. Reactors 4, 5 and 8 are used for PF resin production and Reactors 6, 7 and 8 are used for UF resin production. Running three reactors at the maximum hourly production rate continuously will not reach the permitted resin production limit. Therefore, the emissions are calculated assuming the PF resin will reach the maximum production rate based on the physical capacity and the UF production rate will be the remaining from the permitted limit, since PF resin production has a higher methanol emission rate.

^e Methanol emissions based on an ideal gas and with the following

Molar Mass	32.04 g/mol
Conversion of	453.592 g/lb
Ideal gas molar density @ 20 C	24 L/mol
Conversion of	28.3168 L/ft ³

Table 25: Annual Resin Reactor Methanol Scrubber Emissions

Resin Category	Family	Product(s)	Reactor	Average Flowrate to Scrubber (CFM) ^a	Flowrate (DSCFM) ^b	Scrubber Water (wt% Acetone)	Conversion Factor (ppmv/wt%)	Scrubber Water Temperature Basis (F/C)	Acetone Vapor Concentration (Acetone ppmv) ^c	Acetone Emissions (lbs/hr) ^d	Batch Time hrs/Batch	No. of Batches/Yr	% Vacuum Operation	Total Annual Acetone Emissions (lbs)
UF Resins	Sugar Acetone/Ketone	WB-2527, KF-70	#7	93	90	1	3841	59/15	3841	3.1408	11	2	18.2	12.56

^a See Scrubber Data Study for various types of acetone percentages

^b Air Stream Moisture Content correction

^c Acetone Model (Acetone ppmv)

^d The hours of operation per year are calculated by dividing the permitting resin limit by the maximum hourly production rate. Reactors 4, 5 and 8 are used for PF resin production and Reactors 6, 7 and 8 are used for UF resin production. Running three reactors at the maximum hourly production rate continuously will not reach the permitted resin production limit. Therefore, the emissions are calculated assuming the PF resin will reach the maximum production rate based on the physical capacity and the UF production rate will be the remaining from the permitted limit, since PF resin production has a higher methanol emission rate.

^e Methanol emissions based on an ideal gas and with the following

Molar Mass 58.08 g/mol

Conversion of 453.592 g/lb

Ideal gas molar 24 L/mol

density @ 20 C

Conversion of 28.3168 L/ft³

Table 26: Annual Resin Reactor Phenol Scrubber Emissions

Resin Category	Family	Product(s)	Reactor	Average Flowrate to Scrubber (CFM) ^a	Flowrate (DSCFM) ^b	Scrubber Water (wt% Phenol)	Conversion Factor (ppmv/wt%)	Scrubber Water Temperature Basis (F/C)	Phenol Vapor Concentration (Phenol ppmv) ^c	Phenol Emissions (lbs/hr) ^e	Batch Time hrs/Batch	No. of Batches/Yr	% Vacuum Operation	Total Annual Phenol Emissions (lbs)
PF Resins	PRF	LT-5210D, LT-5210J, G-1181G, AG-5545D,	#5, #8, #4	112	109	0.5	1.7	59/15	0.85	0.001356323	10	174	60	1.42
	PF Plywood	335J, 318G, 3CA34G, IB165B	#4, #5, #8	150	146	0.5	1.7	59/15	0.85	0.001816505	7	23	86	0.25
	Specialty Resins	PF HX-501, PF XCOUR-6, RF-300W, RF-5445S	#4, #5, #8	93	90	0.5	1.7	59/15	0.85	0.001126233	22	5	27	0.03

max hourly production rate
12,217 lb/hs

PF Total lbs
3.20E+08

Thruput limits
Hours of Operation per Year^d
26194 hrs for reactors 4, 5 and 8

Permitted Phenol Emissions
41 lbs for PF Resin Emissions
0.04

^a See Scrubber Data Sheets
^b Air Stream Moisture Content correction
^c MeOH Model (MeOHppmv)
^d The hours of operation per year are calculated by dividing the permitting resin limit by the maximum hourly production rate. When the production rate of resin would cause the total hours of operation per year to exceed 8,760 hours based on this calculation, 8,760 hours is assumed.
^e Phenol emissions based on an ideal gas and with the following
Molar Mass 94.11 g/mol
Conversion of 453.592 g/lb
Ideal gas molar density 24 L/mol
@ 20 C
Conversion of 28.3168 L/ft*3

Table 27: Annual Resin Reactor VOC* Scrubber Emissions:

Resin Category	Family	Product(s)	Reactor	Average Flowrate to Scrubber (CFM) ^a	Flowrate (DSCFM) ^b	Seal Water (wt%DMM)	Conversion Factor (ppmv/wt%)	Scrubber Water Temperature Basis (F/C)	DMM Vapor Concentration (DMM ppmv) ^c	DMM Emissions (lbs/hr) ^d	Batch Time hrs/Batch	No. of Batches/Yr	% Vacuum Operation	Total Annual DMM Emissions (lbs)
PF Resins	PRF	LT-5210D, LT-5210J, G-1181G, AG-5545D, 335J, 318G, 3CA34G, IB165B	#5, #8, #4	112	109	0.06	9137	59/15	548.22	0.707325881	10	174	60	738.45
	PF Plywood	PF HX-501, PF XCOUR-6, RF-300W, RF-5445S	#4, #5, #8	150	146	0.06	9137	59/15	548.22	0.947311448	7	23	86	130.73
	Specialty Resins		#4, #5, #8	93	90	0.06	9137	59/15	548.22	0.587333098	22	5	27	17.62
UF Resins	UF Particleboard	C23WS, RL93F, W132D	#6, #7, #8	93	90	0.06	9137	59/15	548.22	0.587333098	9	438	56	1286.26
	UF Fertilizer	Methylene Urea 28-0-0	#6, #7, #8	93	90	0.06	9137	59/15	548.22	0.587333098	7	5	71	14.68
	UF Hardwood Plywood	LF571, LF551, CR583	#6, #7, #8	93	90	0.06	9137	59/15	548.22	0.587333098	12	221	42	649.00
	Glass Mat	FG-115E, FG486	#6, #7	93	90	0.06	9137	59/15	548.22	0.587333098	8	10	63	29.37
	Catalyst Modifiers	Q-55BC	#6, #7, #8	93	90	0.06	9137	59/15	548.22	0.587333098	7	16	n/a	n/a
	Sugar Acetone/Ketone	WB-2527, KF-70	#7, #9	93	90	0.06	9137	59/15	548.22	0.587333098	11	2	18	2.35
MF Resins	Methylated Melamines	MF-1L, MF-2L, LOM20, L-4345B, L-4305	#9, #8	149	145	0.06	9137	59/15	548.22	0.940996039	10	480	60	2710.07
	Saturating Melamines	707X	#9	95	92	0.06	9137	59/15	548.22	0.599963917	7	21	86	75.60
	Methylated X	SC-748A, LV1259M	#5	112	109	0.06	9137	59/15	548.22	0.707325881	10	20	60	84.88

max hourly production rate

12,217 lbs/hr

18,113 lbs/hr

7,576 lbs/hr

PF Total lbs

UF total lbs

MF total lbs

Thruput limits

3.20E+08

3.20E+08

3.50E+07

Hours of Operation per Year^a

26194 hrs for reactors 4,5 and 8

0 hrs for reactors 6, 7 and 9

4620 hrs for reactors 5,8 and 9

Permitted DMM Emissions

21269 lbs for PF Resin Emissions

0 lbs for UF Resin Emissions

21269 lbs for Max PF/UF Resin Emissions

3726 lbs for MF Resin Emissions

24995 total emissions from resin production

* VOC = DMM, MF

^a See Scrubber Data Sheets^b Air Stream Moisture Content correction^c MeOH Model (MeOHppmv)^d The hours of operation per year are calculated by dividing the permitting resin limit by the maximum hourly production rate. Reactors 4, 5 and 8 are used for PF resin production and Reactors 6, 7 and 8 are used for UF resin production. Running three reactors at the maximum hourly production rate continuously will not reach the permitted resin production limit. Therefore, the emissions are calculated assuming the PF resin will reach the maximum production rate based on the physical capacity and the UF production rate will be the remaining from the permitted limit, since PF resin production has a higher DMM emission rate.^e DMM emissions based on an ideal gas and with the following

Molar Mass 76.095 g/mol

Conversion of 453.592 g/lb

Ideal gas molar density @ 24 L/mol

20 C

Conversion of 28.3168 L/ft³

Table 28: Annual Resin Reactor Triethylamine Scrubber Emissions

Resin Category	Family	Product(s)	Reactor	Average Flowrate to Scrubber (CFM) ^a	Flowrate (DSCFM) ^b	Seal Water (wt% Triethylamine)	Conversion Factor	Scrubber Water Temperature Basis (F/C)	ATE Vapor Concentration (ATE ppmv) ^c	ATE Emissions (lbs/hr) ^d	Batch Time hrs/Batch	No. of Batches/Yr	% Vacuum Operation	Total Annual ATE Emissions (lbs)
UF Resins	UF Particleboard	C23WS, RL93F, W132D	#6, #7, #8	93	90	0.3			n/a	0.14	9	438	56	306.60
	UF Fertilizer	Methylene Urea 28-0-0	#6, #7, #8	93	90	0.3			n/a	0.14	7	5	71	3.50
	UF Hardwood Plywood	LF571, LF551, CR583	#6, #7, #8	93	90	0.3			n/a	0.14	12	221	42	154.70
	Glass Mat	FG-115E, FG486	#6, #7	93	90	0.3			n/a	0.14	8	10	63	7.00
	Catalyst Modifiers	Q-55BC	#6, #7, #8	93	90	0.3			n/a	0.14	7	16	n/a	n/a
	Sugar Acetone/Ketone	WB-2527, KF-70	#7, #9	93	90	0.3			n/a	0.14	11	2	18	0.56

max hourly production rate
18,113 lbs/hr

UF total lbs
3.20E+08

Thruput limits
3.20E+08

Hours of Operation per Year^e
17667 hrs for reactors 6, 7, 8 and 9

Permitted ATE Emissions
1767 lbs for UF Resin Emissions

^a See Scrubber Data Sheets

^b Air Stream Moisture Content correction

^c The hours of operation per year are calculated by dividing the permitting resin limit by the maximum hourly production rate. When the production rate of resin would cause the total hours of operation per year to exceed 8,760 hours based on this calculation, 8,760 hours is assumed.

^d The ATE emission factors were taken from a testing data file

Table 29. Resin Drying Bed Emissions

Resin Drying Bed Parameters			
Resin Drying Bed Throughput ¹	0	tons resin/yr	
	Resin Emission Factors ¹		
Formaldehyde	0.00606	lb emissions / lb resin	
Methanol	0.00252	lb emissions / lb resin	
Phenol	0.00003	lb emissions / lb resin	

Emissions	VOC Emissions (tpy)	HCHO Emissions (tpy)	MeOH Emissions (tpy)	Phenol Emissions (tpy)
Resin Drying bed	0.00	0.00	0.00	0.00E+00

1. Emission factors developed through a resin drying bed study conducted by Hexion for sister facility in La Grande, Oregon. Study submitted to DEQ and dated June 17, 2008.

Table 30. Wax Process Emissions

Plant	Plant Design Capacity (lb/batch)	Batch Time (hr)	Batches Per Year	Slack Wax Used Per Batch (lb/batch) ^a	Max Slack Wax Usage (lb/yr)	Maximum Toulene (assume maximum concentration of 13ppm) lb/yr	PTE Toluene Emissions ton/yr	Note
Springfield Plant	490,000	30	292	343,000	100,156,000	1,302	0.65	Assume all Toluene Volatilizes

^a Per discussion with Chuck Jacobs on 4/2/2021, for slack wax products made at Springfield, worst case percentage that slack wax is of total batch capacity could be:

70%

Table 31: LPE Annual Emissions

Description	Non HAP VOCs	2 - Propanone, Reaction Products with Phenol	4-4' Isopropylidenediphenol	Phenol ⁽²⁾	2,4-Bisphenol A	3-(4-Hydroxyphenyl)-1,1,3-trimethylindan-5-ol	Trisphenol	4-(2,2,4-trimethyl-3H-chromen-4-yl)phenol	2-methylbenzofuran	Mesityl Oxide	Alpha methyl Styrene	HAP		Total VOC	Hydrogen Peroxide
	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)	p-Cresol	o-Cresol	(tpy)	(tpy)
Reactor Loading and Mixing	2.47E-03	7.19E-05	1.08E-04	-	1.17E-04	4.03E-08	5.05E-08	8.06E-08	3.63E-04	1.29E-03	5.24E-04	1.48E-04	1.86E-04	2.81E-03	-
Phenol/LPE Storage Tanks	1.85E-04	6.72E-06	1.01E-05	1.18	1.09E-05	3.84E-09	5.52E-09	7.68E-09	2.83E-05	9.01E-05	3.90E-05	1.08E-05	1.36E-05	1.18E+00	-
Fugitive Emissions	6.58E-01	0.16	0.24	0.28	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.37E-01	0.13
	0.661	0.16	0.24	1.463	0.26	7.98E-05	7.98E-05	1.60E-04	4.00E-04	1.38E-03	5.67E-04	1.66E-04	2.06E-04	2.12E+00	0.13

(1) Maximum annual emissions are estimated as the sum of annual emissions from each source.

(2) Phenol Emissions for Storage are included since the LPE contains Phenol and is stored at a higher temperature. Conservatively, the phenol tank emissions were based on 100% phenol at 85 C.

3.34E-04
2.45E-05
1.40E-05

Table 32: LPE Physical and Chemical Properties

Chemical Name	CAS No.	Range of % by Weight ⁽¹⁾⁽²⁾	Max. % by Weight ⁽¹⁾⁽²⁾	Throughput Per Batch ⁽³⁾	MW ⁽⁴⁾	Pi ⁽⁴⁾⁽⁵⁾⁽⁶⁾	Density ⁽⁷⁾
		(%)	(%)	lb/batch	(lb/lb-mole)	(psia)	(lb/gal)
LPE Solution (Excluding Water)				24,545			
2 - Propanone, Reaction Products with Phenol	72162-28-8	5 - 40%	40%	9,818	228.29	2.20E-06	8.35
4-4' Isopropylidenediphenol	80-05-7	20 - 60%	60%	14,727	228.29	2.20E-06	8.35
Phenol	108-95-2	0 - 70%	70%	17,182	94.11	0.38	8.93
2,4-Bisphenol A	837-08-1	0 - 65%	65%	15,955	228.29	2.20E-06	8.35
3-(4-Hydroxyphenyl)-1,1,3-trimethylindan-5-ol	67746-69-4	0 - 0.02	0.02%	5	268.3502	2.20E-06	8.35
Trisphenol	35924-04-0	0 - 0.02	0.02%	5	376.493	2.20E-06	9.35
4-(2,2,4-trimethyl-3H-chromen-4-yl)phenol	472-41-3	0 - 0.04	0.04%	10	268.3502	2.20E-06	8.35
2-methylbenzofuran	4265-25-2	0 - 0.002%	0.002%	0	132.1592	3.27E-01	8.82
Mesityl Oxide	141-79-7	0 - 0.0008%	0.0008%	0	98.143	3.50E+00	7.14
Alpha methyl Styrene	98-83-9	0 - 0.0009%	0.0009%	0	118.1757	1.12E+00	7.59
p-Cresol	106-44-5	0 - 0.002%	0.0020%	0	108.1378	1.53E-01	8.64
o-Cresol	95-48-7	0 - 0.0015%	0.0015%	0	108.1378	2.57E-01	8.75
Water	7732-18-5	Balance	-	-	-	-	-
Other Additive Solution			0.10%	132.50			
Hydrogen Peroxide (32% solution)	7722-84-1		32%	42.40	34.01	0.24	9.26
Water	7732-18-5	Balance	68%	-	-	-	-

(1) LPE speciation data was provided via email correspondence from Susan Newman, Hexion, to Fei Bian, Trinity Consultants on July 21, 2011.

Additional MSDS information provided via email correspondence from Andrea Perez, Hexion, to Latha Kambham, Trinity Consultants on October 28, 2011.

The range represents the maximum values from the two information sources, in order to provide more flexibility for the Diboll Plant.

(2) Hydrogen peroxide speciation data was provided via email from Susan Newman, Hexion, to Fei Bian, Trinity Consultants, on June 20, 2011.

(3) The total LPE throughput provided by Andrea Perez, Hexion to Latha Kambham, Trinity Consultants on January 9, 2012 during a telephone conversation. The additive solution throughput were provided via email correspondence from Gregory Conrad, Mome

(4) Per email correspondence from Susan Newman, Hexion, to Fei Bian, Trinity Consultants, on March 11, 2011.

(5) Vapor pressures for pure hydrogen peroxide, phenol, and water are calculated using Antoine Equation. Antoine's coefficients are from

(1) http://highered.mcgraw-hill.com/sites/dl/free/0072849606/315014/physical_properties_table.pdf and

(2)

Antoine Equation --> $\log P_i^\circ = A - B/(T+C)$ where T is in °C and P_i° is in bar.

Chemical	CAS	Antoine's Coefficients			LPE Tanks		
		A	B	C	T (°C)	P_i° (mmHg)	P_i° (psia)
LPE Solution							
Phenol	108-95-2	7.133	1,516.79	174.95	85	19.864	0.3841
2-methylbenzofuran	4265-25-2	7.22615	1,766.50	209.53	85	16.920	0.3272
Mesityl Oxide	141-79-7	7.11665	1,480.62	219.75	85	181.179	3.5034
Alpha methyl Styrene	98-83-9	7.12904	1,641.01	220.78	85	57.867	1.1190
p-Cresol	106-44-5	7.46639	1,776.40	185.41	85	7.890	0.1526
o-Cresol		7.26017	1,620.79	179.10	85	13.276	0.2567
Other Additive Solution							
Hydrogen Peroxide	7722-84-1	7.97	1,886.76	220.6	85	62.40	1.21
Water	7732-18-5	7.97	1,668.21	228.00	85	436.77	8.34

(6) Per email correspondence from Susan Newman, Hexion, to Fei Bian, Trinity Consultants, on June 1, 2011, the additive solution contains 32% hydrogen peroxide and a balance of water. The partial pressure for the hydrogen peroxide solution is calculate

	% by Weight ⁽¹⁾	Molecular Weight (lb/lb-mole)	Mole Percent ⁽²⁾ (%)	Partial Vapor Pressure ⁽³⁾ (psia)
Chemical Name				
Hydrogen Peroxide	0.32	34.01	0.199576371	0.24
Water	0.68	18.02	0.800423629	6.67

(1) Per email correspondence from Susan Newman, Hexion to Fei Bian, Trinity Consultants, on June 1, 2011.

(2) Mole Percent (%) = (Hydrogen Peroxide % by Weight (%) / Hydrogen Peroxide Molecular Weight (lb

(3) Partial Vapor Pressure (psia) = Component Mole Percent (%) * Pure Component Vapor Pressure (psia)

(7) Specific gravity of phenol obtained from <http://www.osha.gov/SLTC/healthguidelines/phenol/recognition.html>

Table 33: LPE Reactor Emissions

Process Description and Basis of Calculation:
Emissions are generated from the loading and mixing operations in Reactor A and are controlled by the TG boiler. LPE will be added to Reactor A to manufacture PF Resins in place of phenol. Although LPE contains upto 70% phenol, the use of 100% phenol is authorized under NSR Permit No. 27935. However, to represent emissions more accurately, phenol emissions are calculated based on 100%, since the phenol emissions from the NSR permit may have been underestimated.
Emissions are calculated with the following methods: Loading emissions: based on loading loss calculations from EPA AP-42 Chapter 5.2, <i>Transportation and Marketing of Petroleum Liquids</i> , June 2008; Mixing emissions: based on evaporation rate equation from EPA document 550-B-99-009, <i>Risk Management Program Guidance for Offside Consequence Analysis</i> , April 1999.

Total Reactor Emissions

Reactor	Chemicals	Uncontrolled Emissions from Reactor Loading and Mixing Operations ⁽²⁾		
		(lb/batch)	(lb/hr) ⁽¹⁾	(tpy) ⁽³⁾
	LPE Solution (Excluding Water)			
	2 - Propanone, Reaction Products with Phenol	6.54E-05	1.09E-05	7.19E-05
	4-4' Isopropylidenediphenol	9.81E-05	1.63E-05	1.08E-04
	2,4-Bisphenol A	1.06E-04	1.77E-05	1.17E-04
	3-(4-Hydroxyphenyl)-1,1,3-trimethylindan-5-ol	3.66E-08	6.10E-09	4.03E-08
	Trisphenol	4.59E-08	7.65E-09	5.05E-08
	4-(2,2,4-trimethyl-3H-chromen-4-yl)phenol	7.32E-08	1.22E-08	8.06E-08
	2-methylbenzofuran	3.30E-04	5.50E-05	3.63E-04
	Mesityl Oxide	1.17E-03	1.95E-04	1.29E-03
	Alpha methyl Styrene	4.77E-04	7.94E-05	5.24E-04
	p-Cresol	1.34E-04	2.24E-05	1.48E-04
	o-Cresol	1.69E-04	2.82E-05	1.86E-04
	Other Additive Solution			
Reactor Emissions	Hydrogen Peroxide (32% solution)	4.50337767	0.750562945	-

Footnotes:

- (1) Hourly emissions are calculated based on the duration of each batch (loading and mixing operations) = 6
- (2) Although hydrogen peroxide readily decomposes to water and oxygen during mixing, uncontrolled emissions are estimated to be conservative. It is assumed that 100% of the hydrogen peroxide generated during loading will decompose to water and oxygen whe
- (3) The annual emissions are based on a maximum of 2200 batches per year

A. Loading Emission Calculations

Chemicals ⁽¹⁾	Throughput per Uncontrolled Emissions ^{(3) (4)}		
	Range of % by V Max. Mass cont	(lb/batch)	(lb/batch)
LPE Solution (Excluding Water)		24,545.455	
2 - Propanone, Reaction Products with Phenol	5 - 40%	0.4	9,818.182
4-4' Isopropylidenediphenol	20 - 60%	0.6	14,727.273
2,4-Bisphenol A	0 - 65%	0.65	15,954.545
3-(4-Hydroxyphenyl)-1,1,3-trimethylindan-5-ol	0 - 0.02	0.0002	4.909090909
Trisphenol	0 - 0.02	0.0002	4.909090909
4-(2,2,4-trimethyl-3H-chromen-4-yl)phenol	0 - 0.04	0.0004	9.818181818
2-methylbenzofuran	0 - 0.002%	0.00002	0.490909091
Mesityl Oxide	0 - 0.0008%	0.000008	0.196363636
Alpha methyl Styrene	0 - 0.0009%	0.000009	0.220909091
p-Cresol	0 - 0.002%	0.00002	0.490909091
o-Cresol	0 - 0.0015%	0.000015	0.368181818
Other Additive Solution			132.50
Hydrogen Peroxide (32% solution)		0.32	42.4
Footnotes:			0.000429097

(2) The total LPE and additive solution throughputs were provided via email correspondence from Hexion personnel to Trinity Consultants, or

(3) Loading loss factors are calculated based on AP -42, Chapter 5.2, Equation 1, as represented in the following "Loading Loss Factor Calculu

(4) Emission rate (lb/batch) = Throughput (lb/batch) / density (lb/gal) * Loading Loss (L_L lb/10³ Gal)

Loading Loss Factor Calculations

		2 - Propanone, Reaction Products with Phenol	4-4' Isopropylidenedi phenol	Phenol	2,4-Bisphenol A	3-(4- Hydroxyphene nyl)-1,1,3- trimethylind an-5-ol	Trisphenol	4-(2,2,4- trimethyl-3H- chromen-4- yl)phenol	2- methylbenzofu ran	Mesityl Oxide	Alpha methyl Styrene	p-Cresol	o-Cresol	Hydrogen Peroxide
Saturation Factor (S) ⁽¹⁾	--	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Vapor pressure of liquid loaded (P) ⁽³⁾	psia	2.20E-06	2.20E-06	0.38	2.20E-06	0.0000022	0.0000022	0.0000022	0.327182775	3.503414666	1.1189638	0.15256654	0.2567216	0.23768427
Molecular weight of vapors (M)	lb/lb-mole	228.29	228.29	94.11	228.29	268.3502	376.493	268.3502	132.1592	98.143	118.1757	108.1378	108.1378	34.01
Temperature of bulk liquid loaded (T) ⁽⁴⁾	°R	644.67	644.67	644.67	644.67	644.67	644.67	644.67	644.67	644.67	644.67	644.67	644.67	644.67
Loading Loss (L_L) ⁽⁴⁾	lb/Mgal	5.82427E-06	5.82427E-06	0.419200453	5.82427E-06	6.8463E-06	9.60531E-06	6.84631E-06	0.501440796	3.987334817	1.5334727	0.19132365	0.3219376	0.093743012

Footnotes:

(1) Mode of operation is submerged loading with dedicated normal service (S = 0.6) based on AP 42, Table 5.2-1.

Antoine Equation --> $\log P_i^s = A - B/(T+C)$ where T is in °C and P_i^s is in mmHg.

Chemical	CAS	Antoine's Coefficients			T (°C)	P _i ^s (mmHg) P _i ^s (psia)	
		A	B	C			
LPE Solution							
Phenol	108-95-2		7.133	1516.79	174.95	85	19.86 0.38
Other Additive Solution							
Hydrogen Peroxide	7722-84-1		7.97	1,886.76	220.60	85	62.40 1.19
Water	7732-18-5		7.97	1,668.21	228.00	85	436.77 8.34

(3) Per email correspondence from Hexion personnel to Fei Bian, Trinity Consultants, on June 1, 2011, the additive solution contains 32% hydrogen peroxide and balance is water. The partial pressure for the hydrogen peroxide is calc

Chemical Name	% by Weight ⁽¹⁾	Molecular Weight (lb/lb-mole)		Mole Percent ⁽²⁾	Partial Vapor Pressure ⁽³⁾ (psia)
		(lb/lb-mole)	(%)		
Hydrogen Peroxide	32%		34.01	0.199576371	0.23768427
Water	68%		18.02	0.800423629	6.671902494

(1) Per email correspondence from Hexion personnel to Fei Bian, Trinity Consultants, on June 1, 2011.

(2) Mole Percent (%) = (Hydrogen Peroxide % by Weight (%) / Hydrogen Peroxide Molecular Weight (lb/lbmole)) / ((Hydrogen Peroxide

(3) Partial Vapor Pressure (psia) = Component Mole Percent (%) * Pure Component Vapor Pressure (psia)

(4) Per email correspondence from Hexion personnel to Fei Bian, Trinity Consultants, the LPE loading temperature =

85 °C.

(5) Loading loss is calculated according to Equation 1 of AP 42, Chapter 5-2.

L _L =	(12.46 x S x P x M) / T
L _L =	Loading loss, lb/10 ³ gallons liquid loaded
S =	Saturation Factor from AP-42, Table 5.2-1
P =	True vapor pressure of liquid loaded, psia
M =	Molecular weight of vapors (lb/lb-mol)
T =	Temperature of bulk liquid loaded (°R)

B. Mixing Emission Calculations

Chemicals	Uncontrolled Emissions	
	(lb/min) ^{(1) (2)}	(lb/batch) ⁽³⁾
LPE Solution (Excluding Water)		
2 - Propanone, Reaction Products with Phenol	3.65833E-07	5.85333E-05
4-4' Isopropylidenediphenol	5.4875E-07	8.78E-05
2,4-Bisphenol A	5.94479E-07	9.51166E-05
3-(4-Hydroxyphenyl)-1,1,3-trimethylindan-5-ol	2.03734E-10	3.25974E-08
Trisphenol	2.55329E-10	4.08526E-08
4-(2,2,4-trimethyl-3H-chromen-4-yl)phenol	4.07468E-10	6.51948E-08
2-methylbenzofuran	1.88956E-06	0.00030233
Mesityl Oxide	6.63688E-06	0.0010619
Alpha methyl Styrene	2.69911E-06	0.000431857
p-Cresol	7.70815E-07	0.00012333
o-Cresol	9.7278E-07	0.000155645
Other Additive Solution		
Hydrogen Peroxide (32% solution)	0.028143429	4.502948573

Table 34: LPE Tank Emissions**Process Description and Basis of Calculation:**

Currently, the two Phenol tanks are permitted. With this project, Momentive proposes to store either Phenol or LPE in these tanks. Potential emissions from the storage of LPE are calculated using EPA's Tanks 4.09D program. The two tanks have the same physical characteristics. Therefore, potential emissions are calculated from one tank with the total annual throughput, to be conservative. Since the storage of 100% phenol is already authorized, the phenol emissions from LPE storage are not calculated.

Maximum hourly emissions are calculated per TCEQ Technical Guidance Package for Chemical Sources: Storage Tanks (October 2000).

LPE Storage Tank Design Parameters

Storage Tank Parameters⁽¹⁾

Tank Contents	LPE	LPE
Tank ID ⁽²⁾	LPE - 1	LPE - 2
Location	Springfield, OR	Springfield, OR
Tank Type (Vertical or Horizontal)	Vertical	Vertical
Diameter, ft	12.625	12.625
Shell Height or Length, ft	31	31
Maximum Liquid Height, ft	31	31
Volume, gallons	29027.92195	29027.92195
Throughput, gallons/yr	3023804.057	3023804.057
Annual Turnovers, turnovers/yr	104.168809	104.168809
Turnover Factor (K_N) ⁽³⁾	0.454660744	0.454660744
Working Loss Product Factor (Crude Oil = 0.75,	1	1

(1) Storage tank parameters and throughput provided by Hexion personnel to Fei Biao

(2) PH-1/TPH-2 are currently authorized to store phenol (NSR Permit No. 27935). Wi

(3) Turnover factor (K_N) is calculated per AP-42, Chapter 7 as follows: if $N > 36$ then $K_N = (180 + N) /$

LPE Storage Tank Emissions (per Tank)

Chemical	Emissions of Pure Components ⁽²⁾			Uncontrolled LPE Emissions ⁽³⁾	Controlled LPE Emissions	
	Max. Weight % B _j (lb/yr)	Working Losses (lb/yr)	Breathing Losses (lb/yr)	Total Emissions Annual ⁽⁴⁾ (tpy)	Annual ⁽⁷⁾ (tpy)	
LPE Solution (Excluding Water)						
2 - Propanone, Reaction Products with Phenol	0.4	0.0168	0	0.0168	0.00000336	0.00000336
4-4' Isopropylidenediphenol	0.6	0.0168	0	0.0168	0.00000504	0.00000504
Phenol	1	1184.21	0	1184.21	0.592105	0.592105
2,4-Bisphenol A	0.65	0.0168	0	0.0168	0.00000546	0.00000546
3-(4-Hydroxyphenyl)-1,1,3-trimethylindan-5-ol	0.0002	0.0192	0	0.0192	1.92E-09	1.92E-09
Trisphenol	0.0002	0.0276	0	0.0276	2.76E-09	2.76E-09
4-(2,2,4-trimethyl-3H-chromen-4-yl)phenol	0.0004	0.0192	0	0.0192	3.84E-09	3.84E-09
2-methylbenzofuran	0.00002	1416.49	0	1416.49	1.41649E-05	1.41649E-05
Mesityl Oxide	0.000008	11263.61	0	11263.61	4.50544E-05	4.50544E-05
Alpha methyl Styrene	0.000009	4331.83	0	4331.83	1.94932E-05	1.94932E-05
p-Cresol	0.00002	540.46	0	540.46	5.4046E-06	5.4046E-06
o-Cresol	0.000015	909.42	0	909.42	6.82065E-06	6.82065E-06
				Emissions from E.	0.592209806	0.592209806
				Total Emissions fr	1.184419613	1.184419613

(1) LPE speciation data was provided via email correspondence from Hexion personnel to Trinity Consultants on July 21, 2011 and October 28, 2011.

(2) Working, breathing, and total losses for each constituent in LPE are obtained from TANKS 4.0.9d.

(3) Uncontrolled LPE emissions calculated based on emissions from the pure component and max. weight % of each component in LPE Solution.

(4) Annual Emissions (tpy) = Total Emissions (lb/yr) * Max. Weight % of each component / 2,000 (lb/ton)

(5) Vertical fixed roof storage tanks maximum hourly emissions are calculated per TCEQ Technical Guidance Package for Chemical Sources: Storage Tanks, based on maximum filling rate, vapor pressure at the maximum liquid surface temperature, and a K_N factor of 1.

$$L_{MAX} = L_W \times FR_M / (N \times T_{CG})$$

L_{MAX} = maximum short term emission rate (lb/hr)

L_W = working loss calculated using AP-42 at maximum liquid surface temperature, lbs/yr (L_W must be calculated using a turnover factor, K_N, of 1)

FR_M = maximum filling rate (gal/hr)

N = number of turnovers per year

T_{CG} = tank capacity (gal)

(7) Annual controlled LPE emissions (tpy) = [(Working Losses (lb/yr) * (1 - Collection Efficiency)) + Standing Losses (lb/yr)] / 2,000 (lb/ton)

(8) Hourly controlled LPE emissions (lb/hr) = Hourly Emissions (lb/hr) * (1 - Collection Efficiency)

(9) Since the two storage tanks will not be loaded or unloaded at the same time, maximum hourly emissions represent the emissions from a single tank. However, annual emissions represent total emissions from both tanks, to be conservative.

Table 35: LPE Fugitive Emissions**Process Description and Basis of Calculation:**

Hydrogen peroxide emissions are generated from fugitive components associated with the hydrogen peroxide totes, resin handling equipment, and a new in-line mixing system. Momentive would also like to mix the additive solution and resin solution using the in-line mixing system before loading the final resin product to tank trucks or railcars.

Fugitive emissions are calculated using SOCOMI without ethylene emission factors from TCEQ Technical Guidance Package for Equipment Leak Fugitives, Draft, October 2000.

I. Summary of Fugitive Emission Rates

Pollutant

Emission Rates

Hourly Max.

Annual

(lb/hr)

(tpy)

LPE Solution (Excluding Water)		
2 - Propanone, Reaction Products with Phenol	0.04	0.16
4-4' Isopropylidenediphenol	0.05	0.24
Phenol	0.06	0.28
2,4-Bisphenol A	0.06	0.26
3-(4-Hydroxyphenyl)-1,1,3-trimethylindan-5-ol	1.82E-05	7.97E-05
Trisphenol	1.82E-05	7.97E-05
4-(2,2,4-trimethyl-3H-chromen-4-yl)phenol	3.64E-05	1.59E-04
2-methylbenzofuran	1.82E-06	7.97E-06
Mesityl Oxide	7.28E-07	3.19E-06
Alpha methyl Styrene	8.19E-07	3.59E-06
p-Cresol	1.82E-06	7.97E-06
o-Cresol	1.37E-06	5.98E-06

Other Additive Solution

Hydrogen Peroxide	0.03	0.13
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II. Emission Calculations

Fugitive Components for Hydrogen Peroxide Handling ⁽¹⁾

Component	Service	SOCMI w/o C2 Emission Factors (lb/hr/cpt) ^{(2) (3)}	Equipment Count ⁽⁴⁾	Annual Hours of Operation (hrs/yr)	Emissions ^{(5) (6)}	
					(lb/hr)	(tpy)
Valves	Light Liquid	0.0035	10	8760	0.035	0.1533
Relief Valves	Light Liquid	0.0035	1	8760	0.0035	0.01533
Flanges	Light Liquid	0.0005	22	8760	0.011	0.04818
Pumps	Light Liquid	0.0386	1	8760	0.0386	0.169068
Connectors	Light Liquid	0.0005	12	8760	0.006	0.02628
Total					0.0941	0.412158
Total Hydrogen Peroxide (32%)					0.030112	0.13189056

Footnotes:

(1) Fugitive emissions were estimated for the added fugitive components (valves, flanges, pumps) associated with the hydrogen peroxide tote.

(2) SOCMI without ethylene emission factors from TCEQ Technical Guidance Package for Equipment Leak Fugitives, Draft, October 2000.

(3) Per page 8 of TCEQ Guidance, emissions from liquid relief valves should be estimated in the same manner as light liquid valves.

(4) Component counts were provided by Hexion Diboll Plant on June 17, 2011, as listed in the following Fugitive Component Counts Table.

(5) Emissions (lb/hr) = SOCMI w/o C2 Emission Factors (lb/hr/cpt) * Equipment Count (cpt)

(6) Emissions (tpy) = Emissions (lb/hr) * Annual Hours of Operation (hrs/yr) * 1 ton / 2,000 lb

Fugitive Emissions from the Existing Phenol/LPE Line⁽¹⁾

Component	Service	SOCMI w/o C2 Emission Factors (lb/hr/cpt) ⁽²⁾⁽³⁾	Equipment Count ⁽⁴⁾	Annual Hours of Operation (hr/yr)	Emissions ⁽⁵⁾⁽⁶⁾	
					(lb/hr)	(tpy)
Valves	Heavy Liquid	0.0007	50	8760	0.035	0.1533
Flanges	Heavy Liquid	0.00007	110	8760	0.0077	0.033726
Pumps	Heavy Liquid	0.0161	3	8760	0.0483	0.211554
		Total LPE			0.09	0.40
		Maximum 2 - Propanone, Reaction Products with Phenol (40%)			0.04	0.16
		Maximum 4-4' Isopropylidenediphenol (60%)			0.05	0.24
		Maximum Phenol (70%)			0.0637	0.279006
		Maximum 2,4-Bisphenol A (65%)			0.06	0.26
		3-(4-Hydroxyphenyl)-1,1,3-trimethylindan-5-ol			1.82E-05	7.97E-05
		Trisphenol			1.82E-05	7.97E-05
		4-(2,2,4-trimethyl-3H-chromen-4-yl)phenol			3.64E-05	1.59E-04
		2-methylbenzofuran			1.82E-06	7.97E-06
		Mesityl Oxide			7.28E-07	3.19E-06
		Alpha methyl Styrene			8.19E-07	3.59E-06
		p-Cresol			1.82E-06	7.97E-06
		o-Cresol			1.37E-06	5.98E-06

Footnotes:

(1) Fugitive emissions were estimated for the fugitive components (valves, flanges, pumps) associated with the existing phenol line. Since phenol emissions are already authorized,

(2) SOCMI without ethylene emission factors from TCEQ Technical Guidance Package for Equipment Leak Fugitives, Draft, October 2000.

(3) Per page 8 of TCEQ Guidance, emissions from liquid relief valves should be estimated in the same manner as light liquid valves.

(4) Component counts were provided by Hexion Diboll Plant as listed in the following Fugitive Component Counts Table.

(5) Emissions (lb/hr) = SOCMI w/o C2 Emission Factors (lb/hr/cpt) * Equipment Count (cpt)

(6) Emissions (tpy) = Emissions (lb/hr) * Annual Hours of Operation (hrs/yr) * 1 ton / 2,000 lb

III. Fugitive Component Counts

System	Peroxide Tote	LPE Phenol Line
	Fugitive Counts ⁽¹⁾ (2)	
Valves	10	50
Pressure Relief Valve	1	0
Flanges	22	110
Connectors	12	0
Pumps	1	3
Agitators	0	0

(1) Fugitive component counts summarized based on information provided by Hexion Diboll Plant on June 1, 2011 and June 20, 2011.

(2) It is assumed that there are 2 flanges/connectors for each pump or valve.

(3) Since existing phenol line is already permitted under the NSR permit, the emissions of new compounds from the existing pipelines are calcu

Per email from Denise Robertson on 11/16/2011.

Additional components in phenol/LPE line:

3" Automatic block valves - Qty. 5

3" Static mixers - Qty. 2

3" Mass flow meter - Qty. 1

Flow switch - Qty. 1

VP of 32% H₂O₂ at 68F

24 mmHg
0.458021053 psia

Per the MSDS provided by Joel via email on 08/22/2011
It is Light Liquid (VP > 0.044 psia)

Fugitive Components for the PF Resin Service ⁽¹⁾

Component	Service	SOCMI w/o C2 Em Equipment Count ⁽⁴⁾	Annual Hours of Operation (hr/yr)	Emissions ^{(5) (6)}		
				(lb/hr)	(tpy)	
Valves	Light Liquid	0.0035	0	8760	0	0
Flanges	Light Liquid	0.0005	0	8760	0	0
Pumps	Light Liquid	0.0386	0	8760	0	0
Total Emissions from PF Resin					0	0
Maximum LPE in PF Resin ⁽⁷⁾ (21					0	0
Maximum 2 - Propanone, Reacti					0	0
Maximum 4-4' Isopropylidenedip					0	0
Maximum Phenol (70%)					0	0
Maximum 2,4-Bisphenol A (65%					0	0

Footnotes:

(1) Fugitive emissions due to addition of LPE were estimated for the fugitive components (valves, flanges, pumps) associated with the PF resin service line.

(2) SOCMI without ethylene emission factors from TCEQ Technical Guidance Package for Equipment Leak Fugitives, Draft, October 2000.

(3) Per page 8 of TCEQ Guidance, emissions from liquid relief valves should be estimated in the same manner as light liquid valves.

(4) Component counts were provided by Hexion Diboll Plant as listed in the following Fugitive Component Counts Table.

(5) Emissions (lb/hr) = SOCMI w/o C2 Emission Factors (lb/hr/cpt) * Equipment Count (cpt)

(6) Emissions (tpy) = Emissions (lb/hr) * Annual Hours of Operation (hrs/yr) * 1 ton / 2,000 lb

(7) Per email correspondence from Hexion personnel to Fei Bian, Trinity Consultants, on June 20, 2011, the PF resin product contains 21.41% phenol. Since Hexion intends to

Table 36: Adjusted PTE (Future) Based on Further Refinement Spectrum Testing Including Trenches

[illegible]

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E112
FIN: FM-1

Tank Properties	
Parameter	Input
Tank Identification	FM-1
CIN	N/A
Tank Contents	Formaldehyde Solution
Discharging In	Scrubber
EPN	E112
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psia	0
Breather Vent Vacuum Setting, psia	0
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashins Occurs?	No
Emission Control Method	Scrubber
Emission Control Efficiency	0

Tank Parameters	
Parameter	Input
Diameter, ft.	22.00
Shell Height or Length, ft.	28.00
Nominal Capacity, gal	79,621
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, F	149
Measured Maximum Liquid Bulk Temperature, F	149
Measured Minimum Liquid Bulk Temperature, F	149
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Formaldehyde Solution
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	4,780,516
Vapor Molecular Weight, lb/lbmol	MV	Input	19.94
Vapor Pressure Coefficient A	A	Input	—
Vapor Pressure Coefficient B	B	Input	—
Vapor Pressure Coefficient C	C	Input	—
Effective Diameter, ft.	DE	Equation 1-14	22.00
Effective Height, ft.	HE	Equation 1-15	28.00
Maximum Liquid Height, ft.	HLX	Equation 1-37	27.00
Minimum Liquid Height, ft.	HLN	Equation 1-37	1.00
Average Liquid Height, ft.	HL	Equation 1-36	13.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft.	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft.	HR	Equation 1-20	N/A
Roof Outcrop, ft.	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outcrop, ft.	HVO	Equation 1-16	15.00
Vapor Space Volume, ft ³	VV	Equation 1-3	5761.99
Average Daily Minimum Ambient Temperature, R	TAM	Table 7-1-7	562.47
Average Daily Maximum Ambient Temperature, R	TAX	Table 7-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7-1-7	1284
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 7-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-29, 1-8, & 1-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, & 1-2	608.67
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1-17	608.67
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1-17	608.67
Liquid Bulk Temperature, R	TLB	Equation 1-31, & 1-2	608.67
Average Vapor Temperature, R	TV	Equation 1-30, 1-34	608.67
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-28	3.3969
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-28	3.3969
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-28	3.3969
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0104
Daily Vapor Pressure range, psi	ΔPV	Equation 1-8	0.0000
Breather Vent Pressure Setting, psia	PBP	N/A	0.00
Breather Vent Vacuum Setting, psia	PBV	N/A	0.00
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.00
Ambient Pressure, psia	PA	Table 7-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.2702
Net Working Loss Throughput, ft ³	VO	Equation 1-39	63926.84
Sum of Increases in Liquid Level, ft.	ΔHOL	Equation 1-37	1660.00
Annual Turnover	N	Equation 1-36	64.65
Working Loss Turnover Factor	KN	Equation 1-35	0.61
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-43	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	4178.6623
Total Losses, lb/yr	LT	Equation 1-1	4,178.66
Total Losses, tpy	LT	N/A	2.0893
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	11,4484
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.4770
Controlled Emissions			
Total Annual Emissions, tpy			2.0893
Avg. Daily Emissions, lb/hr			0.4770

Speciated Emissions	Vapor wt%	Uncontrolled		Controlled	
		tpy	lb/hr	tpy	lb/hr
Formaldehyde	20.31%	0.4243	0.0999	0.4243	0.0999
Methanol	1.43%	0.0715	0.0163	0.0715	0.0163
Total VOC	76.27%	0.4958	0.1132	0.4958	0.1132

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E113
FIN: FM-2

Tank Properties	
Tank Properties	Input
Tank Identification	FM-2
CIN	N/A
Tank Contents	Formaldehyde Solution
Discharging In	Scrubber
EPN	E113
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psia	0
Breather Vent Vacuum Setting, psia	0
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashins Occurs?	No
Emission Control Method	Scrubber
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft.	22.00
Shell Height or Length, ft	28.00
Nominal Capacity, gal	79,621
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, F	149
Measured Maximum Liquid Bulk Temperature, F	149
Measured Minimum Liquid Bulk Temperature, F	149
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Formaldehyde Solution
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	4,780,516
Vapor Molecular Weight, lb/lbmol	MV	Input	19.94
Vapor Pressure Coefficient A	A	Input	—
Vapor Pressure Coefficient B	B	Input	—
Vapor Pressure Coefficient C	C	Input	—
Effective Diameter, ft	DE	Equation 1-14	22.00
Effective Height, ft	HE	Equation 1-15	28.00
Maximum Liquid Height, ft	HLX	Equation 1-37	27.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-36	13.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	15.00
Vapor Space Volume, ft ³	VV	Equation 1-3	5761.99
Average Daily Minimum Ambient Temperature, R	TAM	Table 7-1-7	562.47
Average Daily Maximum Ambient Temperature, R	TAX	Table 7-1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7-1-7	1284
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7-1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-29, 1-8, & 1-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, & 1-2	608.67
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1-17	608.67
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1-17	608.67
Liquid Bulk Temperature, R	TLB	Equation 1-31, & 1-2	608.67
Average Vapor Temperature, R	TV	Equation 1-30, 1-34	608.67
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-28	3.3969
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-28	3.3969
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-28	3.3969
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0104
Daily Vapor Pressure range, psi	ΔPV	Equation 1-8	0.0000
Breather Vent Pressure Setting, psia	PBP	N/A	0.00
Breather Vent Vacuum Setting, psia	PBV	N/A	0.00
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.00
Ambient Pressure, psia	PA	Table 7-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.2702
Net Working Loss Throughput, ft ³	VO	Equation 1-39	63926.84
Sum of Increases in Liquid Level, ft	ΔHOL	Equation 1-37	1660.00
Annual Turnover	N	Equation 1-36	64.65
Working Loss Turnover Factor	KN	Equation 1-35	0.61
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-43	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	4178.6623
Total Losses, lb/yr	LT	Equation 1-1	4,178.66
Total Losses, tpy	LT	N/A	2.0893
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	11,4484
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.4770
Controlled Emissions			
Total Annual Emissions, tpy			2.0893
Avg. Daily Emissions, lb/hr			0.4770

Speciated Emissions	Vapor wt%	Uncontrolled		Controlled	
		tpy	lb/hr	tpy	lb/hr
Formaldehyde	20.31%	0.4243	0.0999	0.4243	0.0999
Methanol	1.43%	0.0715	0.0163	0.0715	0.0163
Total VOC	76.27%	0.4958	0.1132	0.4958	0.1132

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E114
FIN: FM-3

Tank Properties	
Parameter	Input
Tank Identification	FM-3
CIN	N/A
Tank Contents	Formaldehyde Solution
Discharging In	Scrubber
EPN	E114
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psia	0
Breather Vent Vacuum Setting, psia	0
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashins Occurs?	No
Emission Control Method	Scrubber
Emission Control Efficiency	0

Tank Parameters	
Parameter	Input
Diameter, ft.	12.53
Shell Height or Length, ft	22.00
Nominal Capacity, gal	26,297
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, F	149
Measured Maximum Liquid Bulk Temperature, F	149
Measured Minimum Liquid Bulk Temperature, F	149
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Formaldehyde Solution
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,218,533
Vapor Molecular Weight, lb/lbmol	MV	Input	19.94
Vapor Pressure Coefficient A	A	Input	—
Vapor Pressure Coefficient B	B	Input	—
Vapor Pressure Coefficient C	C	Input	—
Effective Diameter, ft	DE	Equation 1-14	12.53
Effective Height, ft	HE	Equation 1-15	22.00
Maximum Liquid Height, ft	HLX	Equation 1-37	21.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-36	10.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outcrop, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outcrop, ft	HVO	Equation 1-16	12.00
Vapor Space Volume, ft ³	VV	Equation 1-3	1479.99
Average Daily Minimum Ambient Temperature, R	TAN	Table 1-7	562.47
Average Daily Maximum Ambient Temperature, R	TAX	Table 1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, (Btu/ft ² ·day)	I	Table 1-17	1284
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 1-16	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 1-16	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-27, 1-28, & 1-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, & 1-2	608.67
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 1-17	608.67
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 1-17	608.67
Liquid Bulk Temperature, R	TLB	Equation 1-31, & 1-2	608.67
Average Vapor Temperature, R	TV	Equation 1-30, 1-34	608.67
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	3.3969
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	3.3969
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	3.3969
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0104
Daily Vapor Pressure range, psi	ΔPV	Equation 1-8	0.0000
Breather Vent Pressure Setting, psia	PBP	N/A	0.00
Breather Vent Vacuum Setting, psia	PBV	N/A	0.00
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.00
Ambient Pressure, psia	PA	Table 1-17	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.3164
Net Working Loss Throughput, ft ³	VO	Equation 1-39	16287.38
Sum of Increases in Liquid Level, ft	ΔHOL	Equation 1-37	1320.03
Annual Turnover	N	Equation 1-36	66.03
Working Loss Turnover Factor	KN	Equation 1-35	0.62
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-43	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	1048,7524
Total Losses, lb/yr	LT	Equation 1-1	1,048,75
Total Losses, tpy		N/A	0.5244
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	2,8724
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.1197
Controlled Emissions			
Total Annual Emissions, tpy			0.5244
Avg. Daily Emissions, lb/hr			0.1197

Speciated Emissions	Vapor wt%	Uncontrolled		Controlled	
		tpy	lb/hr	tpy	lb/hr
Formaldehyde	20.33%	0.1065	0.0243	0.1065	0.0243
Methanol	1.43%	0.0079	0.0041	0.0079	0.0041
Total VOC	76.27%	0.1244	0.0284	0.1244	0.0284

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E115
FIN: FM-4

Tank Properties	
Parameter	Input
Tank Identification	FM-4
CIN	N/A
Tank Contents	Formaldehyde Solution
Discharging In	Scrubber
EPN	E115
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psia	0
Breather Vent Vacuum Setting, psia	0
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashins Occurs?	No
Emission Control Method	Scrubber
Emission Control Efficiency	0

Tank Parameters	
Parameter	Input
Diameter, ft.	12.53
Shell Height or Length, ft	22.00
Nominal Capacity, gal	26,297
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, F	149
Measured Maximum Liquid Bulk Temperature, F	149
Measured Minimum Liquid Bulk Temperature, F	149
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Formaldehyde Solution
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,218,533
Vapor Molecular Weight, lb/lbmol	MV	Input	19.94
Vapor Pressure Coefficient A	A	Input	—
Vapor Pressure Coefficient B	B	Input	—
Vapor Pressure Coefficient C	C	Input	—
Effective Diameter, ft	DE	Equation 1-14	12.53
Effective Height, ft	HE	Equation 1-15	22.00
Maximum Liquid Height, ft	HLX	Equation 1-37	21.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-36	10.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outcrop, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outcrop, ft	HVO	Equation 1-16	12.00
Vapor Space Volume, ft ³	VV	Equation 1-3	1479.99
Average Daily Minimum Ambient Temperature, R	TAN	Table 1-7	562.47
Average Daily Maximum Ambient Temperature, R	TAX	Table 1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, (Btu/ft ² ·day)	I	Table 1-17	1284
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 1-16	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 1-16	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-27, 1-28, B-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, B-2	608.67
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 1-17	608.67
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 1-17	608.67
Liquid Bulk Temperature, R	TB	Equation 1-31, B-2	608.67
Average Vapor Temperature, R	TV	Equation 1-30, 1-34	608.67
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	3.3969
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	3.3969
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	3.3969
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0104
Daily Vapor Pressure range, psi	ΔPV	Equation 1-8	0.0000
Breather Vent Pressure Setting, psia	BPB	N/A	0.00
Breather Vent Vacuum Setting, psia	BPV	N/A	0.00
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.00
Ambient Pressure, psia	PA	Table 1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.3164
Net Working Loss Throughput, ft ³	VO	Equation 1-39	16287.30
Sum of Increases in Liquid Level, ft	ΔHOL	Equation 1-37	1320.03
Annual Turnover	N	Equation 1-36	66.03
Working Loss Turnover Factor	KN	Equation 1-35	0.62
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-43	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	1048,7524
Total Losses, lb/yr	LT	Equation 1-1	1,048,75
Total Losses, tpy		N/A	0.5244
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	2,8724
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.1197
Controlled Emissions			
Total Annual Emissions, tpy			0.5244
Avg. Daily Emissions, lb/hr			0.1197

Speciated Emissions	Vapor wt%	Uncontrolled		Controlled	
		tpy	lb/hr	tpy	lb/hr
Formaldehyde	20.31%	0.1065	0.0243	0.1065	0.0243
Methanol	1.43%	0.0079	0.0041	0.0079	0.0041
Total VOC	76.27%	0.1244	0.0284	0.1244	0.0284

Tank Properties	
Tank Properties	Input
Tank Identification	10-24
CIN	N/A
Tank Contents	Trichloro
Discharging to	Atmosphere
CIN	000
Location for Calculation Purposes	Superior, OR
Tank/Pool Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Refractor Vent Pressure Setting, <i>psig</i>	0
Refractor Vent Vacuum Setting, <i>inches Hg</i>	0
Pressure at Vapor Space at Normal Condition, <i>psig</i>	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficacy	

[illegible]

Rechnungen	Ergebnis	Rechnungsnummer	Rechnungsdatum	Rechnungsart	Rechnungsart	Rechnungsart
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Parameter	Symbol	Reference/Equation	Product 1	Product 2	Product 3
Process Speed	λ	Table 1	NA	NA	NA
Process Delay	τ	Table 1	NA	NA	NA
Transmission coefficient	α	Eq. 1	1.071241	1.071241	1.071241
Temperature of the environment	T_{amb}	Table 1	NA	NA	NA
Heat capacity of the object	C	Table 1	NA	NA	NA
Heat transfer coefficient	h	Table 1	NA	NA	NA
Volume of the object	V	Table 1	NA	NA	NA
Thermal conductivity	k	Table 1	NA	NA	NA
Thermal mass	M	Eq. 2	12.76	12.76	12.76
Thermal capacitance	C_{th}	Eq. 3	12.76	12.76	12.76
Thermal time constant	τ_{th}	Eq. 4	20.00	20.00	20.00
Thermal resistance	R_{th}	Eq. 5	20.00	20.00	20.00
Thermal conductance	G_{th}	Eq. 6	1.000	1.000	1.000
Thermal capacity	Q_{th}	Eq. 7	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 8	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 9	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 10	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 11	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 12	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 13	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 14	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 15	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 16	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 17	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 18	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 19	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 20	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 21	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 22	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 23	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 24	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 25	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 26	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 27	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 28	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 29	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 30	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 31	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 32	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 33	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 34	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 35	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 36	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 37	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 38	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 39	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 40	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 41	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 42	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 43	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 44	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 45	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 46	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 47	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 48	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 49	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 50	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 51	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 52	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 53	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 54	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 55	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 56	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 57	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 58	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 59	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 60	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 61	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 62	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 63	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 64	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 65	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 66	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 67	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 68	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 69	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 70	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 71	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 72	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 73	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 74	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 75	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 76	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 77	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 78	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 79	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 80	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 81	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 82	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 83	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 84	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 85	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 86	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 87	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 88	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 89	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 90	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 91	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 92	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 93	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 94	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 95	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 96	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 97	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 98	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 99	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 100	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 101	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 102	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 103	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 104	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 105	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 106	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 107	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 108	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 109	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 110	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 111	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 112	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 113	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 114	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 115	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 116	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 117	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 118	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 119	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 120	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 121	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 122	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 123	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 124	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 125	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 126	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 127	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 128	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 129	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 130	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 131	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 132	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 133	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 134	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 135	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 136	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 137	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 138	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 139	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 140	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 141	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 142	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 143	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 144	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 145	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 146	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 147	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 148	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 149	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 150	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 151	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 152	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 153	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 154	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 155	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 156	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 157	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 158	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 159	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 160	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 161	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 162	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 163	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 164	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 165	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 166	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 167	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 168	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 169	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 170	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 171	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 172	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 173	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 174	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 175	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 176	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 177	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 178	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 179	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 180	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 181	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 182	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 183	1.000	1.000	1.000
Thermal time constant	τ_{th}	Eq. 184	1.000	1.000	1.000
Thermal resistance	R_{th}	Eq. 185	1.000	1.000	1.000
Thermal capacitance	C_{th}	Eq. 186	1.000	1.000	1.000
Thermal time constant	<				

Speciated Emissions	Product 1			Product 2			Product 3		
	Uncontrolled			Uncontrolled			Uncontrolled		
	Vapor wt%	gpy	lb/hr	Vapor wt%	gpy	lb/hr	Vapor wt%	gpy	lb/hr
Methanol	54.05%	0.0158	0.0006	11.80%	0.0016	0.0004	48.07%	0.0023	0.0009
MEA	0.01%	0.0003	0.0000	0.00%	0.0000	0.0000	0.02%	0.0000	0.0000
Hydrogen	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000
Total VOC	54.06%	0.0160	0.0006	11.80%	0.0016	0.0004	48.09%	0.0023	0.0009

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E87
FIN: U-15

Tank Properties

Tank Properties	Input
Tank Identification	U-15
CIN	N/A
Tank Contents	Triazines
Discharging to	Atmosphere
EPN	E87
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	12.74
Shell Height or Length, ft	21.00
Nominal Capacity, gal	20,010
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

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Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Product 1	Product 2	Product 3
Product Stored		Input	Triazines	Triazines	Triazines
Type of Substance		Select One	Organic Liquid	Organic Liquid	Organic Liquid
Throughput, gallons/yr	Q	Input	1,167,612	1,167,612	1,167,612
Vapor Molecular Weight, lb/lbmol	MV	Input	23.66	19.01	22.83
Vapor Pressure Coefficient A	A	Input	--	--	--
Vapor Pressure Coefficient B	B	Input	--	--	--
Vapor Pressure Coefficient C	C	Input	--	--	--
Effective Diameter, ft	DE	Equation 1-14	12.74	12.74	12.74
Effective Height, ft	HE	Equation 1-15	21.00	21.00	21.00
Maximum Liquid Height, ft	HLX	Equation 1-37	20.00	20.00	20.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00	1.00	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.50	9.50	9.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000	0.0000	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A	N/A	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A	N/A	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000	0.0000	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	11.50	11.50	11.50
Vapor Space Volume, ft ³	VV	Equation 1-3	1464.86	1464.86	1464.86
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37	502.37	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47	522.47	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10	20.10	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204	1204	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42	512.42	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A	N/A	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A	N/A	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00	0.00	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42	512.42	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	512.42	512.42	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	512.42	512.42	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42	512.42	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42	512.42	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2692	0.1589	0.2460
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.2692	0.1589	0.2460

Hexion, Inc.
Springfield Plant - Springfield, OR
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Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.2692	0.1589	0.2460
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0012	0.0005	0.0010
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000	0.0000	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03	0.03	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03	-0.03	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0	0	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06	0.06	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50	14.50	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000	0.0000	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.8590	0.9117	0.8696
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	156070.86	156070.86	156070.86
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1225.24	1225.24	1225.24
Annual Turnovers	N	Equation 1-36	193.46	193.46	193.46
Working Loss Turnover Factor	KN	Equation 1-35	0.32	0.32	0.32
Working Loss Product Factor	KP	Equation 1-35	1.00	1.00	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00	1.00	1.00
Uncontrolled Emissions					
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000	0.0000	0.0000
Working Loss, lb/yr	LW	Equation 1-35	58.1637	27.5927	51.2816
Total Losses, lb/yr	LT	Equation 1-1	58.1637	27.5927	51.2816
Total Losses, tpy	LT	N/A	0.0291	0.0138	0.0256
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.1594	0.0756	0.1405
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0066	0.0031	0.0059

Speciated Emissions		Product 1			Product 2			Product 3		
		Uncontrolled			Uncontrolled			Uncontrolled		
		Vapor wt%	tpy	lb/hr	Vapor wt%	tpy	lb/hr	Vapor wt%	tpy	lb/hr
Methanol		54.45%	0.0158	0.0036	11.85%	0.0016	0.0004	48.07%	0.0123	0.0028
MEA		0.01%	0.0000	0.0000	0.05%	0.0000	0.0000	0.03%	0.0000	0.0000
Triazine		0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000
Total VOC		54%	0.0158	0.0036	12%	0.0016	0.0004	48%	0.0123	0.0028

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: 0
FIN: U-16

Tank Properties

Tank Properties	Input
Tank Identification	U-16
CIN	N/A
Tank Contents	Triazines
Discharging to	Atmosphere
EPN	0
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0
Breather Vent Vacuum Setting, psig	0
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	12.50
Shell Height or Length, ft	28.00
Nominal Capacity, gal	25,704
Shell Paint Color	Stainless Steel
Shell Paint Condition	New
Shell Insulated?	No
Roof Paint Color	Stainless Steel
Roof Paint Condition	New
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

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Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Product 1	Product 2	Product 3
Product Stored		Input	Triazines	Triazines	Triazines
Type of Substance		Select One	Organic Liquid	Organic Liquid	Organic Liquid
Throughput, gallons/yr	Q	Input	1,469,854	1,469,854	1,469,854
Vapor Molecular Weight, lb/lbmol	MV	Input	23.59	19.00	22.76
Vapor Pressure Coefficient A	A	Input	--	--	--
Vapor Pressure Coefficient B	B	Input	--	--	--
Vapor Pressure Coefficient C	C	Input	--	--	--
Effective Diameter, ft	DE	Equation 1-14	12.50	12.50	12.50
Effective Height, ft	HE	Equation 1-15	28.00	28.00	28.00
Maximum Liquid Height, ft	HLX	Equation 1-37	27.00	27.00	27.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00	1.00	1.00
Average Liquid Height, ft	HL	Equation 1-16	13.00	13.00	13.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000	0.0000	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A	N/A	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A	N/A	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000	0.0000	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	15.00	15.00	15.00
Vapor Space Volume, ft ³	VV	Equation 1-3	1840.78	1840.78	1840.78
Average Daily Minimum Ambient Temperature, R	TAN	Table 7-1-7	502.37	502.37	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7-1-7	522.47	522.47	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10	20.10	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7-1-7	1204	1204	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42	512.42	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7-1-6	0.60	0.60	0.60
Tank Shell Solar Absorptance, dimensionless	αS	Table 7-1-6	0.60	0.60	0.60
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	28.52	28.52	28.52
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	516.28	516.28	516.28
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	509.15	509.15	509.15
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	523.41	523.41	523.41
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	514.59	514.59	514.59
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	517.98	517.98	517.98
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.3080	0.1830	0.2818
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.2398	0.1407	0.2189
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.3927	0.2360	0.3600
Vapor Density, lb/ft ³	VV	Equation 1-22	0.0013	0.0006	0.0012
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.1529	0.0953	0.1411
Breather Vent Pressure Setting, psig	PBP	N/A	0.00	0.00	0.00
Breather Vent Vacuum Setting, psig	PBV	N/A	0.00	0.00	0.00
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0	0	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.00	0.00	0.00
Ambient Pressure, psia	PA	Table 7-1-7	14.50	14.50	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0513	0.0513	0.0513
Vented Vapor Saturation Factor	KS	Equation 1-21	0.8033	0.8730	0.8170
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	196470.52	196470.52	196470.52
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1600.99	1600.99	1600.99
Annual Turnovers	N	Equation 1-36	184.73	184.73	184.73
Working Loss Turnover Factor	RN	Equation 1-35	0.33	0.33	0.33
Working Loss Product Factor	KP	Equation 1-35	1.00	1.00	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00	1.00	1.00
Uncontrolled Emissions					
Standing Storage Loss, lb/yr	LS	Equation 1-2	36.2221	18.8329	32.5215
Working Loss, lb/yr	LW	Equation 1-35	84.5271	40.4402	74.6213
Total Losses, lb/yr	LT	Equation 1-1	120.7492	59.2731	107.1428
Total Losses, tpy	LT	N/A	0.0604	0.0296	0.0536
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.3308	0.1624	0.2935
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0138	0.0068	0.0122

Speciated Emissions	Product 1 Uncontrolled			Product 2 Uncontrolled			Product 3 Uncontrolled		
	Vapor wt%	tpy	lb/hr	Vapor wt%	tpy	lb/hr	Vapor wt%	tpy	lb/hr
Methanol	53.96%	0.0326	0.0074	11.65%	0.0035	0.0008	47.58%	0.0255	0.0058
MEA	0.01%	0.0000	0.0000	0.06%	0.0000	0.0000	0.00%	0.0000	0.0000
Triazine	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000	0.00%	0.0000	0.0000
Total VOC	54%	0.0326	0.0074	12%	0.0035	0.0008	48%	0.0255	0.0058

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: Controlled by E1
FIN: M-2

Tank Properties	
Tank Properties	Input
Tank Identification	M-2
CIN	N/A
Tank Contents	Methanol
Discharging to	Scrubber
EPN	Controlled by E1
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.07226
Breather Vent Vacuum Setting, psig	0.10839
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	Scrubber
Emission Control Efficiency	0.95

Tank Parameters	
Diameter, ft	32.90
Shell Height or Length, ft	40.00
Nominal Capacity, gal	254,374
Shell Paint Color	white
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	white
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Methanol
Type of Substance		Select One	Organic Liquid
Throughput, gal/yr	Q	Input	19,772,319
Vapor Molecular Weight, lb/mol	MV	Input	32.04
Vapor Pressure Coefficient A	A	Input	8.079
Vapor Pressure Coefficient B	B	Input	1581.3
Vapor Pressure Coefficient C	C	Input	239.65
Effective Diameter, ft	DE	Equation 1-14	32.90
Effective Height, ft	HE	Equation 1-15	40.00
Maximum Liquid Height, ft	HLX	Equation 1-37	39.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	19.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 = 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	21.00
Vapor Space Volume, ft ³	VV	Equation 1-3	17852.58
Average Daily Minimum Ambient Temperature, R	TAN	Table 7-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7-1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7-1-6	0.25
Tank Shell Solar Absorptance, dimensionless	αS	Table 7-1-6	0.25
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	20.09
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 9-2	514.16
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	509.14
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	519.18
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	513.32
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	515.00
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	1.2416
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	1.0564
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	1.4542
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0072
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.3979
Breather Vent Pressure Setting, psia	PBP	N/A	0.07
Breather Vent Vacuum Setting, psia	PBV	N/A	0.11
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	-0.04
Ambient Pressure, psia	PA	Table 7-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0718
Vented Vapor Saturation Factor	KS	Equation 1-21	0.4198
Net Working Loss Throughput, ft ³	VO	Equation 1-39	2642899.94
Sum of Increases in Liquid Level, ft	ΣHQL	Equation 1-37	3108.84
Annual Turnovers	N	Equation 1-36	81.81
Working Loss Turnover Factor	KN	Equation 1-35	0.53
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	1414.0640
Working Loss, lb/yr	LW	Equation 1-35	10147.1414
Total Losses, lb/yr	LT	Equation 1-1	11561.2054
Total Losses, tpy		N/A	5,7806
Avg. Daily Total Losses, lb/day	LAvg	Annualized Daily Average	31.6745
Avg. Hourly Total Losses, lb/hr	LAvg	Annualized Hourly Average	1.3198
Controlled Emissions			
Total Annual Emissions, tpy		0.2890	
Avg. Daily Emissions, lb/day		1.5837	
Avg. Hourly Emissions, lb/hr		0.0660	

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E47
FIN: P-1

Tank Properties	
Tank Properties	Input
Tank Identification	P-1
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E47
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	11.87
Shell Height or Length, ft	28.60
Nominal Capacity, gal	23,196
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	62.8
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,448,936
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	11.87
Effective Height, ft	HE	Equation 1-15	28.00
Maximum Liquid Height, ft	HLX	Equation 1-37	27.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	13.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outflow, ft	HVO	Equation 1-16	15.00
Vapor Space Volume, ft ³	VV	Equation 1-3	1661.15
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-9, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	VV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	BPB	N/A	0.03
Breather Vent Vacuum Setting, psig	BPV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7308
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	193674.44
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1748.85
Annual Turnovers	N	Equation 1-36	67.26
Working Loss Turnover Factor	KN	Equation 1-35	0.61
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	25,2603
Working Loss, lb/yr	LW	Equation 1-35	186,9680
Total Losses, lb/yr	LT	Equation 1-1	212.23
Total Losses, tpy	LT	N/A	0.1061
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.5814
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0242

Speculated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	4.08E-07	9.27E-08
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0000	0.0000
Formaldehyde	0.49%	0.0005	0.0001
Methanol	6.01%	0.0064	0.0015
Methylene Glycol	0.04%	0.0000	0.0000
Hemiformal	0.22%	0.0002	0.0001
Total VOC	6.83%	0.0072	0.0017

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E48
FIN: P-2

Tank Properties	
Tank Properties	Input
Tank Identification	P-2
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E48
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	11.87
Shell Height or Length, ft	28.60
Nominal Capacity, gal	23,196
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	62.8
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,448,936
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	11.87
Effective Height, ft	HE	Equation 1-15	28.00
Maximum Liquid Height, ft	HLX	Equation 1-37	27.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	13.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outflow, ft	HVO	Equation 1-16	15.00
Vapor Space Volume, ft ³	VV	Equation 1-3	1661.15
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-9, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7308
Net Working Loss Throughput, ft ³	WQ	Equation 1-39	193674.44
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1748.85
Annual Turnovers	N	Equation 1-36	67.26
Working Loss Turnover Factor	KN	Equation 1-35	0.61
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	25,2603
Working Loss, lb/yr	LW	Equation 1-35	186,9680
Total Losses, lb/yr	LT	Equation 1-1	212.23
Total Losses, tpy	LT	N/A	0.1061
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.5814
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0242

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	4.08E-07	9.27E-08
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0000	0.0000
Formaldehyde	0.49%	0.0005	0.0001
Methanol	6.01%	0.0064	0.0015
Methylene Glycol	0.04%	0.0000	0.0000
Hemiformal	0.22%	0.0002	0.0001
Total VOC	6.83%	0.0072	0.0017

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E49
FIN: P-3

Tank Properties	
Tank Properties	Input
Tank Identification	P-3
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E49
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	12.63
Shell Height or Length, ft	22.00
Nominal Capacity, gal	20,610
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.6
Measured Maximum Liquid Bulk Temperature, F	62.6
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,287,443
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	12.63
Effective Height, ft	HE	Equation 1-15	22.00
Maximum Liquid Height, ft	HLX	Equation 1-37	21.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	10.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outflow, ft	HVO	Equation 1-16	12.00
Vapor Space Volume, ft ³	VV	Equation 1-3	1500.85
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-9, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	aPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	BPB	N/A	0.03
Breather Vent Vacuum Setting, psig	BPV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	APB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7724
Net Working Loss Throughput, ft ³	WQ	Equation 1-39	172688.23
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1374.10
Annual Turnovers	N	Equation 1-36	68.70
Working Loss Turnover Factor	KN	Equation 1-35	0.60
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	24.1533
Working Loss, lb/yr	LW	Equation 1-35	163.5921
Total Losses, lb/yr	LT	Equation 1-1	187.75
Total Losses, tpy	LT	N/A	0.0939
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.5144
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0214

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	3.29E-07	8.20E-08
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0000	0.0000
Formaldehyde	0.49%	0.0005	0.0001
Methanol	6.01%	0.0056	0.0013
Methylene Glycol	0.04%	0.0000	0.0000
Hemiformal	0.22%	0.0002	0.0000
Total VOC	6.83%	0.0004	0.0015

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E50
FIN: P-4

Tank Properties	
Tank Properties	Input
Tank Identification	P-4
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E50
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	12.63
Shell Height or Length, ft	22.00
Nominal Capacity, gal	20,610
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.6
Measured Maximum Liquid Bulk Temperature, F	62.6
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,287,443
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	12.63
Effective Height, ft	HE	Equation 1-15	22.00
Maximum Liquid Height, ft	HLX	Equation 1-37	21.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	10.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outflow, ft	HVO	Equation 1-16	12.00
Vapor Space Volume, ft ³	VV	Equation 1-3	1501.85
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-9, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	VV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	aPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	BPB	N/A	0.03
Breather Vent Vacuum Setting, psig	BPV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	BPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7724
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	172688.23
Sum of Increases in Liquid Level, ft	XHQI	Equation 1-37	1374.10
Annual Turnovers	N	Equation 1-36	68.70
Working Loss Turnover Factor	KN	Equation 1-35	0.60
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00

Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	24.1533
Working Loss, lb/yr	LW	Equation 1-35	163.5921
Total Losses, lb/yr	LT	Equation 1-1	187.75
Total Losses, tpy	LT	N/A	0.0939
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.5144
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0214

Speciated Emissions			
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	3.29E-07	8.20E-08
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0000	0.0000
Formaldehyde	0.49%	0.0005	0.0001
Methanol	6.01%	0.0056	0.0013
Methylene Glycol	0.04%	0.0000	0.0000
Hemiformal	0.22%	0.0002	0.0000
Total VOC	6.83%	0.0004	0.0015

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E51
FIN: P-5

Tank Properties	
Tank Properties	Input
Tank Identification	P-5
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E51
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	16.79
Shell Height or Length, ft	20.00
Nominal Capacity, gal	33,137
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Chilled
Measured Liquid Bulk Temperature, F	69.8
Measured Maximum Liquid Bulk Temperature, F	69.8
Measured Minimum Liquid Bulk Temperature, F	69.8
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	2,069,909
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	16.79
Effective Height, ft	HE	Equation 1-15	20.00
Maximum Liquid Height, ft	HLX	Equation 1-37	19.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	11.00
Vapor Space Volume, ft ³	VV	Equation 1-3	2436.36
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-9, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	529.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	529.47
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	529.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	529.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	529.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	BPB	N/A	0.03
Breather Vent Vacuum Setting, psig	BPV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7873
Net Working Loss Throughput, ft ³	WQ	Equation 1-39	278677.27
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1249.18
Annual Turnovers	N	Equation 1-36	69.40
Working Loss Turnover Factor	KN	Equation 1-35	0.60
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	257.6623
Total Losses, lb/yr	LT	Equation 1-1	257.66
Total Losses, tpy	LT	N/A	0.1288
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.7059
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0294

Speculated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	4.93E-07	1.13E-07
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0001	0.0000
Formaldehyde	0.49%	0.0006	0.0001
Methanol	6.01%	0.0077	0.0018
Methylene Glycol	0.04%	0.0001	0.0000
Hemiformal	0.22%	0.0003	0.0001
Total VOC	6.83%	0.0088	0.0020

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E52
FIN: P-6

Tank Properties	
Tank Properties	Input
Tank Identification	P-6
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E52
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	16.79
Shell Height or Length, ft	20.00
Nominal Capacity, gal	33,137
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Chilled
Measured Liquid Bulk Temperature, F	69.8
Measured Maximum Liquid Bulk Temperature, F	69.8
Measured Minimum Liquid Bulk Temperature, F	69.8
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	2,069,909
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	16.79
Effective Height, ft	HE	Equation 1-15	20.00
Maximum Liquid Height, ft	HLX	Equation 1-37	19.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	11.00
Vapor Space Volume, ft ³	VV	Equation 1-3	2436.36
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	529.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	529.47
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	529.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	529.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	529.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	BPB	N/A	0.03
Breather Vent Vacuum Setting, psig	BPV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7873
Net Working Loss Throughput, ft ³	WQ	Equation 1-39	278677.27
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1495.18
Annual Turnovers	N	Equation 1-36	69.40
Working Loss Turnover Factor	KN	Equation 1-35	0.60
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	257.6623
Total Losses, lb/yr	LT	Equation 1-1	257.66
Total Losses, tpy	LT	N/A	0.1288
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.7059
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0294

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	4.93E-07	1.13E-07
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0001	0.0000
Formaldehyde	0.49%	0.0006	0.0001
Methanol	6.01%	0.0077	0.0018
Methylene Glycol	0.04%	0.0001	0.0000
Hemiformal	0.22%	0.0003	0.0001
Total VOC	6.83%	0.0088	0.0020

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E53
FIN: P-13

Tank Properties	
Tank Properties	Input
Tank Identification	P-13
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E53
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	11.96
Shell Height or Length, ft	20.00
Nominal Capacity, gal	16,809
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	62.8
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,049,954
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	11.96
Effective Height, ft	HE	Equation 1-15	20.00
Maximum Liquid Height, ft	HLX	Equation 1-37	19.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	11.00
Vapor Space Volume, ft ³	VV	Equation 1-3	1235.83
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-9, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7873
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	140243.80
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1249.18
Annual Turnovers	N	Equation 1-36	69.40
Working Loss Turnover Factor	KN	Equation 1-35	0.60
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	20.2460
Working Loss, lb/yr	LW	Equation 1-35	132.4493
Total Losses, lb/yr	LT	Equation 1-1	152.70
Total Losses, tpy	LT	N/A	0.0763
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.4183
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0174

Speculated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	2.92E-07	6.67E-08
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0000	0.0000
Formaldehyde	0.49%	0.0004	0.0001
Methanol	6.01%	0.0046	0.0010
Methylene Glycol	0.04%	0.0000	0.0000
Hemiformal	0.22%	0.0002	0.0000
Total VOC	6.83%	0.0052	0.0012

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E54
FIN: P-14

Tank Properties	
Tank Properties	Input
Tank Identification	P-14
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E54
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	11.96
Shell Height or Length, ft	20.00
Nominal Capacity, gal	16,809
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	62.8
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,049,954
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	11.96
Effective Height, ft	HE	Equation 1-15	20.00
Maximum Liquid Height, ft	HLX	Equation 1-37	19.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outflow, ft	HVO	Equation 1-16	11.00
Vapor Space Volume, ft ³	VV	Equation 1-3	1235.83
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-9, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7873
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	140243.80
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1249.18
Annual Turnovers	N	Equation 1-36	69.40
Working Loss Turnover Factor	KN	Equation 1-35	0.60
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	20.2460
Working Loss, lb/yr	LW	Equation 1-35	132.4493
Total Losses, lb/yr	LT	Equation 1-1	152.70
Total Losses, tpy	LT	N/A	0.0763
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.4183
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0174

Speculated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	2.02E-07	5.67E-08
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0000	0.0000
Formaldehyde	0.49%	0.0004	0.0001
Methanol	6.01%	0.0046	0.0010
Methylene Glycol	0.04%	0.0000	0.0000
Hemiformal	0.22%	0.0002	0.0000
Total VOC	6.83%	0.0052	0.0012

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E55
FIN: P-15

Tank Properties	
Tank Properties	Input
Tank Identification	P-15
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E55
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	12.39
Shell Height or Length, ft	20.50
Nominal Capacity, gal	18,489
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.6
Measured Maximum Liquid Bulk Temperature, F	62.6
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,154,949
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	12.39
Effective Height, ft	HE	Equation 1-15	20.50
Maximum Liquid Height, ft	HLX	Equation 1-37	19.50
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.25
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	11.25
Vapor Space Volume, ft ³	VV	Equation 1-3	1356.40
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-9, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	BPB	N/A	0.03
Breather Vent Vacuum Setting, psig	BPV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7835
Net Working Loss Throughput, ft ³	WQ	Equation 1-39	154578.18
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1286.41
Annual Turnovers	N	Equation 1-36	69.21
Working Loss Turnover Factor	KN	Equation 1-35	0.60
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	22.144
Working Loss, lb/yr	LW	Equation 1-35	145.0792
Total Losses, lb/yr	LT	Equation 1-1	168.09
Total Losses, tpy	LT	N/A	0.0840
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.4605
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0192

Speciated Emissions		Uncontrolled	
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	3.22E-07	7.35E-08
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0000	0.0000
Formaldehyde	0.49%	0.0004	0.0001
Methanol	6.01%	0.0051	0.0012
Methylene Glycol	0.04%	0.0000	0.0000
Hemiformal	0.22%	0.0002	0.0000
Total VOC	6.83%	0.0057	0.0013

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E56
FIN: P-16

Tank Properties	
Tank Properties	Input
Tank Identification	P-16
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E56
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	11.40
Shell Height or Length, ft	22.00
Nominal Capacity, gal	16,809
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	62.8
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,049,954
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	11.40
Effective Height, ft	HE	Equation 1-15	22.00
Maximum Liquid Height, ft	HLX	Equation 1-37	21.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	10.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	12.00
Vapor Space Volume, ft ³	VV	Equation 1-3	1225.62
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-9, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7724
Net Working Loss Throughput, ft ³	WQ	Equation 1-39	146043.80
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1374.10
Annual Turnovers	N	Equation 1-36	68.70
Working Loss Turnover Factor	KN	Equation 1-35	0.60
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00

Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	19.6979
Working Loss, lb/yr	LW	Equation 1-35	133.4149
Total Losses, lb/yr	LT	Equation 1-1	153.11
Total Losses, tpy	LT	N/A	0.0766
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.4195
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0175

Speculated Emissions			
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	2.21E-07	6.69E-08
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0000	0.0000
Formaldehyde	0.49%	0.0004	0.0001
Methanol	6.01%	0.0046	0.0011
Methylene Glycol	0.04%	0.0000	0.0000
Hemiformal	0.22%	0.0002	0.0000
Total VOC	6.83%	0.0052	0.0012

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E57
FIN: P-17

Tank Properties

Tank Properties	Input
Tank Identification	P-17
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E57
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	13.93
Shell Height or Length, ft	14.00
Nominal Capacity, gal	15,968
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Chilled
Measured Liquid Bulk Temperature, F	69.8
Measured Maximum Liquid Bulk Temperature, F	69.8
Measured Minimum Liquid Bulk Temperature, F	69.8
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	997,456
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	13.93
Effective Height, ft	HE	Equation 1-15	14.00
Maximum Liquid Height, ft	HLX	Equation 1-37	13.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	6.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	8.00

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E57
FIN: P-17

Vapor Space Volume, ft ³	VV	Equation 1-3	1219.79
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	529.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	529.47
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	529.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	529.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	529.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.8358
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	133326.61
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	874.43
Annual Turnovers	N	Equation 1-36	72.87
Working Loss Turnover Factor	KN	Equation 1-35	0.58
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	119.8961
Total Losses, lb/yr	LT	Equation 1-1	119.90
Total Losses, tpy	LT	N/A	0.0599
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.3285
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0137

Speciated Emissions	Vapor wt%	Uncontrolled	
		tpy	lb/hr
Ethylene Glycol	0.000%	2.29E-07	5.24E-08
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0000	0.0000
Formaldehyde	0.49%	0.0003	0.0001
Methanol	6.01%	0.0036	0.0008
Methylene Glycol	0.04%	0.0000	0.0000
Hemiformal	0.22%	0.0001	0.0000
Total VOC	6.83%	0.0041	0.0009

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E58
FIN: P-18

Tank Properties	
Tank Properties	Input
Tank Identification	P-18
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E58
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	12.71
Shell Height or Length, ft	20.00
Nominal Capacity, gal	18,970
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Chilled
Measured Liquid Bulk Temperature, F	69.8
Measured Maximum Liquid Bulk Temperature, F	69.8
Measured Minimum Liquid Bulk Temperature, F	69.8
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,184,948
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	12.71
Effective Height, ft	HE	Equation 1-15	20.00
Maximum Liquid Height, ft	HLX	Equation 1-37	19.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outflow, ft	HVO	Equation 1-16	11.00
Vapor Space Volume, ft ³	VV	Equation 1-3	1394.73
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	529.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	529.47
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	529.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	529.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	529.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7873
Net Working Loss Throughput, ft ³	WQ	Equation 1-39	158388.00
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1249.18
Annual Turnovers	N	Equation 1-36	69.40
Working Loss Turnover Factor	KN	Equation 1-35	0.60
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00

Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	147.5023
Total Losses, lb/yr	LT	Equation 1-1	147.50
Total Losses, tpy	LT	N/A	0.0738
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.4041
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0168

Speculated Emissions			
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	2.82E-07	6.45E-08
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0000	0.0000
Formaldehyde	0.49%	0.0004	0.0001
Methanol	6.01%	0.0044	0.0010
Methylene Glycol	0.04%	0.0000	0.0000
Hemiformal	0.22%	0.0002	0.0000
Total VOC	6.83%	0.0050	0.0012

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E59
FIN: P-27

Tank Properties	
Tank Properties	Input
Tank Identification	P-27
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E59
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	12.63
Shell Height or Length, ft	30.00
Nominal Capacity, gal	28,094
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	62.8
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,754,922
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	12.63
Effective Height, ft	HE	Equation 1-15	30.00
Maximum Liquid Height, ft	HLX	Equation 1-37	29.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	14.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outflow, ft	HVO	Equation 1-16	16.00
Vapor Space Volume, ft ³	VV	Equation 1-3	2003.02
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-9, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	BPB	N/A	0.03
Breather Vent Vacuum Setting, psig	BPV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7179
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	224574.63
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1873.77
Annual Turnovers	N	Equation 1-36	66.92
Working Loss Turnover Factor	KN	Equation 1-35	0.61
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	29.9218
Working Loss, lb/yr	LW	Equation 1-35	227,2973
Total Losses, lb/yr	LT	Equation 1-1	257.22
Total Losses, tpy	LT	N/A	0.1286
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.7047
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0294

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	4.92E-07	1.17E-07
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0001	0.0000
Formaldehyde	0.49%	0.0006	0.0001
Methanol	6.01%	0.0077	0.0018
Methylene Glycol	0.04%	0.0001	0.0000
Hemiformal	0.22%	0.0003	0.0001
Total VOC	6.83%	0.0088	0.0020

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E60
FIN: P-28

Tank Properties	
Tank Properties	Input
Tank Identification	P-28
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E60
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	12.63
Shell Height or Length, ft	30.00
Nominal Capacity, gal	28,094
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	62.8
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,754,922
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	12.63
Effective Height, ft	HE	Equation 1-15	30.00
Maximum Liquid Height, ft	HLX	Equation 1-37	29.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	14.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	16.00
Vapor Space Volume, ft ³	VV	Equation 1-3	2003.02
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-9, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	BPB	N/A	0.03
Breather Vent Vacuum Setting, psig	BPV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7179
Net Working Loss Throughput, ft ³	WQ	Equation 1-39	224574.63
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1873.77
Annual Turnovers	N	Equation 1-36	66.92
Working Loss Turnover Factor	KN	Equation 1-35	0.61
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	29.9218
Working Loss, lb/yr	LW	Equation 1-35	227,2973
Total Losses, lb/yr	LT	Equation 1-1	257.22
Total Losses, tpy	LT	N/A	0.1286
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.7047
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0294

Speculated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	4.92E-07	1.17E-07
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0001	0.0000
Formaldehyde	0.49%	0.0006	0.0001
Methanol	6.01%	0.0077	0.0018
Methylene Glycol	0.04%	0.0001	0.0000
Hemiformal	0.22%	0.0003	0.0001
Total VOC	6.83%	0.0088	0.0020

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E61
FIN: P-29

Tank Properties	
Tank Properties	Input
Tank Identification	P-29
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E61
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	11.87
Shell Height or Length, ft	20.00
Nominal Capacity, gal	16,568
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Chilled
Measured Liquid Bulk Temperature, F	69.8
Measured Maximum Liquid Bulk Temperature, F	69.8
Measured Minimum Liquid Bulk Temperature, F	69.8
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,034,954
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	11.87
Effective Height, ft	HE	Equation 1-15	20.00
Maximum Liquid Height, ft	HLX	Equation 1-37	19.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outflow, ft	HVO	Equation 1-16	11.80
Vapor Space Volume, ft ³	VV	Equation 1-3	1218.18
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-9, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	529.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	529.47
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	529.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	529.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	529.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	BPB	N/A	0.03
Breather Vent Vacuum Setting, psig	BPV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7873
Net Working Loss Throughput, ft ³	WQ	Equation 1-39	138328.89
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1249.18
Annual Turnovers	N	Equation 1-36	69.40
Working Loss Turnover Factor	KN	Equation 1-35	0.60
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	128.8311
Total Losses, lb/yr	LT	Equation 1-1	128.83
Total Losses, tpy	LT	N/A	0.0644
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.3530
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0147

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	2.47E-07	5.63E-08
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0000	0.0000
Formaldehyde	0.49%	0.0003	0.0001
Methanol	6.01%	0.0039	0.0009
Methylene Glycol	0.04%	0.0000	0.0000
Hemiformal	0.22%	0.0001	0.0000
Total VOC	6.83%	0.0044	0.0010

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E62
FIN: P-30

Tank Properties	
Tank Properties	Input
Tank Identification	P-30
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	E62
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	13.49
Shell Height or Length, ft	15.00
Nominal Capacity, gal	16,028
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Chilled
Measured Liquid Bulk Temperature, F	69.8
Measured Maximum Liquid Bulk Temperature, F	69.8
Measured Minimum Liquid Bulk Temperature, F	69.8
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,001,206
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	13.49
Effective Height, ft	HE	Equation 1-15	15.00
Maximum Liquid Height, ft	HLX	Equation 1-37	14.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	6.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	8.50
Vapor Space Volume, ft ³	VV	Equation 1-3	1214.17
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-9, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	529.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	529.47
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	529.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	529.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	529.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	BPB	N/A	0.03
Breather Vent Vacuum Setting, psig	BPV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.8273
Net Working Loss Throughput, ft ³	WQ	Equation 1-39	13,382.64
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	936.89
Annual Turnovers	N	Equation 1-36	72.07
Working Loss Turnover Factor	KN	Equation 1-35	0.58
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00

Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	121,298.7
Total Losses, lb/yr	LT	Equation 1-1	121.30
Total Losses, tpy	LT	N/A	0.0006
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.3323
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0139

Speciated Emissions			
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	2.33E-07	5.30E-08
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0000	0.0000
Formaldehyde	0.49%	0.0003	0.0001
Methanol	6.01%	0.0006	0.0008
Methylene Glycol	0.04%	0.0000	0.0000
Hemiformal	0.22%	0.0001	0.0000
Total VOC	6.83%	0.0041	0.0009

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: 0
FIN: P-32

Tank Properties	
Tank Properties	Input
Tank Identification	P-32
CIN	N/A
Tank Contents	PF Resin
Discharging to	Atmosphere
EPN	0
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flushing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	12.50
Shell Height or Length, ft	21.60
Nominal Capacity, gal	19,278
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Chilled
Measured Liquid Bulk Temperature, F	69.8
Measured Maximum Liquid Bulk Temperature, F	69.8
Measured Minimum Liquid Bulk Temperature, F	69.8
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,204,208
Vapor Molecular Weight, lb/lbmol	MV	Input	19.07
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	12.50
Effective Height, ft	HE	Equation 1-15	21.00
Maximum Liquid Height, ft	HLX	Equation 1-37	20.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	11.50
Vapor Space Volume, ft ³	VV	Equation 1-3	1411.26
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 2-1-6	0.64
Tank Shell Solar Absorptance, dimensionless	aS	Table 2-1-6	0.64
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-9, 8-1	29.48
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	525.11
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 2-1-17	529.47
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 2-1-17	529.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	529.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	520.76
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4633
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4633
Vapor Density, lb/ft ³	VV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	BPB	N/A	0.03
Breather Vent Vacuum Setting, psig	BPV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0531
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7798
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	160962.49
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	1311.64
Annual Turnovers	N	Equation 1-36	69.03
Working Loss Turnover Factor	KN	Equation 1-35	0.60
Working Loss Product Factor	KP	Equation 1-35	1.60
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	33.6965
Working Loss, lb/yr	LW	Equation 1-35	152.9901
Total Losses, lb/yr	LT	Equation 1-1	186.69
Total Losses, tpy	LT	N/A	0.0933
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.5115
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0213

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Ethylene Glycol	0.000%	3.57E-07	8.16E-08
Phenol	0.03%	0.0000	0.0000
Ethanol	0.04%	0.0000	0.0000
Formaldehyde	0.49%	0.0005	0.0001
Methanol	6.01%	0.0056	0.0013
Methylene Glycol	0.04%	0.0000	0.0000
Hemiformal	0.22%	0.0002	0.0000
Total VOC	6.83%	0.0004	0.0015

Hexion, Inc.
Springfield Plant - Springfield, OR
EPA 609
FIN: P-7

Task Properties	
Task Properties	Input
Task Identification	P-7
CUA	N/A
Task Contents	PPZ Basin
Dispersivity In	Assumes
PM	Assumes
Location for Calculation Parameters	Assumes, OR
Task/Reel Type	Flat
Underground?	Assumed
Indoor?	Indoor
Weather Vent Pressure Setting, mmHg	0.03
Weather Vent Vacuum Setting, mmHg	-0.02
Presence of Vapor Space at Normal Conditions, mmHg	0
Task Vapor Release and Flaming Control?	No Control
Emission Control Method	No Control
Emission Control Efficiency	0

Task Parameters	
Task Parameters	Input
Diameter, ft	13.00
Roof Height to Liquid, ft	13.00
Normal Capacity, gal	13,063
Roof Point Color	Assumes
Roof Insulated?	No
Roof Point Coefficient	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, °F	77
Measured Maximum Liquid Bulk Temperature, °F	77
Measured Minimum Liquid Bulk Temperature, °F	77
Maximum Number of Heating Cycles per Year	12

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.3.1.1

Parameter	Symbol	Reference/Equation	Amount
Process Stream			PPZ Basin
Type of Substance	O	Subst. Data	Organic Liquid
Theoretical Volatility	O	Subst.	863.629
Vapor Molecular Weight, lb/mol	MV	Subst.	24.84
Vapor Pressure Coefficient A	A	Subst.	24.84
Vapor Pressure Coefficient B	B	Subst.	---
Vapor Pressure Coefficient C	C	Subst.	---
Effusion Coefficient	CE	Equation 7.3.6	11.00
Effusion Height, ft	HE	Equation 7.3.5	13.00
Maximum Liquid Height, ft	HSL	Equation 7.3.7	13.00
Minimum Liquid Height, ft	HSL	Equation 7.3.7	13.00
Average Liquid Height, ft	HL	Equation 7.3.6	8.75
Cone Tank Roof Slope, ft/ft	SR	Equation 7.3.8	0.0000
Cone Tank Roof Radius, ft	RR	Equation 7.3.9	N/A
Cone Tank Roof Height, ft	HR	Equation 7.3.9	N/A
Roof Outcrop, ft	HRO	Equation 7.3.7 + 7.3.10	0.0000
Vapor Space Volume, ft ³	VVS	Equation 7.3.8	18.75
Vapor Space Volume, ft ³	VVS	Equation 7.3	1031.44
Average Daily Maximum Ambient Temperature, °F	TAM	Table 7.3.1	59.17
Average Daily Maximum Ambient Temperature, °F	TAM	Table 7.3.1	59.17
Average Daily Ambient Temperature Range, °F	ATA	Table 7.3.1	24.47
Average Daily Ambient Temperature, °F	ATA	Equation 7.3.1	26.31
Average Daily Ambient Temperature, °F	ATA	Table 7.3.1	129.4
Average Daily Ambient Temperature, °F	ATA	Equation 7.3.9	52.43
Task Roof Solar Absorptance, dimensionless	AS	Table 7.3.4	N/A
Task Steel Solar Absorptance, dimensionless	AS	Table 7.3.4	N/A
Average Daily Vapor Temperature Range, °F	ATV	Equation 7.7, 7.8, 8.1	5.36
Average Daily Liquid Surface Temperature, °F	TLA	Equation 7.7, 7.8, 8.1	59.67
Average Daily Maximum Liquid Surface Temperature, °F	TLA	Table 7.3.17	59.67
Average Daily Minimum Liquid Surface Temperature, °F	TLA	Table 7.3.17	59.67
Liquid Bulk Temperature, °F	TV	Equation 7.3.1, 8.1	59.67
Average Vapor Temperature, °F	TV	Equation 7.3.1, 8.1	59.67
Vapor Pressure at Avg. Daily Liquid Surf. Temp., mmHg	PVL	Equation 7.25, 1.26	0.8623
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., mmHg	PVL	Equation 7.25, 1.26	0.8623
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., mmHg	PVL	Equation 7.25, 1.26	0.8623
Vapor Density, lb/ft ³	VDV	Equation 7.22	0.0030
Daily Vapor Pressure range, mmHg	ΔPV	Equation 7.9	0.0000
Weather Vent Pressure Setting, mmHg	PPV	N/A	0.03
Weather Vent Vacuum Setting, mmHg	PPV	N/A	-0.02
Presence of Vapor Space at Normal Conditions, mmHg	PT	Equation 7.4.1	0
Weather Vent Pressure Setting Range, mmHg	ΔPPV	Equation 7.10	0.36
Ambient Pressure, mmHg	PA	Table 7.3.1	14.50
Vapor Space Expansion Factor	SE	Equation 7.3.1, 7.3.2	0.0000
Vertical Vapor Expansion Factor	ES	Equation 7.3.1	0.751
Roof Workable Loss Threshold, ft ³	WLT	Equation 7.39	112,754.83
Sum of Increases in Liquid Level, ft	ΣΔL	Equation 7.37	121.28
Annual Turnover	N	Equation 7.36	89.68
Monthly Loss Turnover Factor	MLT	Equation 7.35	6.60
Monthly Loss Product Factor	MLP	Equation 7.36	1.00
Level Setting Correction Factor	CS	Equation 7.40, 7.41	1.00
Uncontrolled Emissions			
Operating Storage Loss, lb/yr	LS	Equation 7.2	0.0000
Monthly Loss, lb/yr	LM	Equation 7.36	116.6148
Total Losses, lb/yr	LT	Equation 7.1	116.61
Total Losses, lb/yr	LT	N/A	0.0000
Avg. Daily Total Losses, lb/day	LAVD	Annualized Daily Average	0.3194
Avg. Hourly Total Losses, lb/hr	LAVD	Annualized Hourly Average	0.0130

Speciated Emissions	Vapor with	Uncontrolled	lb/yr
Chlorine Gas	0.010%	1.40E-05	1.83E-06
Phenol	0.000%	0.0000	0.0000
Chlorine	0.000%	0.0137	0.0011
Hydrogen Sulfide	0.000%	0.0000	0.0000
Ammonia	0.000%	0.0000	0.0000
Formaldehyde	0.000%	0.0000	0.0000
Methanol	0.000%	0.0002	0.0011
Methane Gas	0.000%	0.0000	0.0000
Hydrogen Chloride	0.000%	0.0000	0.0000
Hydrogen Cyanide	0.000%	0.0000	0.0000
Total VOC	27.22%	0.0188	0.0015

Hexion, Inc.
Springfield Plant - Springfield, OR
EPA 610
FIN: P-8

Task Properties	
Task Properties	Input
Task Identification	P-8
CUA	N/A
Task Contents	PPZ Basin
Dispersible In	Ammonia
PH	PH=
Location for Calculation Parameters	Exhausts, OR
Task/Boat Type	Flat
Underwater?	Aboveground
Indoor?	Indoor
Weather Vent Pressure Setting, mmHg	0.03
Weather Vent Vacuum Setting, mmHg	-0.03
Presence of Vapor Space at Normal Conditions, mmHg	No
Task Vapor Release and Flaming Control?	No Control
Emission Control Method	
Emission Control Efficiency	0

Task Parameters	
Task Parameters	Input
Diameter, ft	13.00
Roof Height to Liquid, ft	13.00
Normal Capacity, gal	13,063
Roof Point Color	Ammonia
Roof Insulated?	No
Roof Point Color	Average
Roof Insulated?	No
Roof Point Color	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, °F	77
Measured Maximum Liquid Bulk Temperature, °F	77
Measured Minimum Liquid Bulk Temperature, °F	77
Maximum Number of Heating Cycles per Year	12

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.3.1.1

Parameter	Symbol	Reference Equation	Amount
Process Stream			PPZ Basin
Type of Substance	O	Subst. Out	Organic Liquid
Theoretical Volatility	Q	Input	863.629
Vapor Molecular Weight, lb/mol	MV	Input	29.88
Vapor Pressure Coefficient A	A	Input	24.88
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effusion Diameter, ft	DE	Equation 7.3.1.6	11.60
Effusion Height, ft	HE	Equation 7.3.1.5	13.00
Maximum Liquid Height, ft	HL	Equation 7.3.7	18.50
Minimum Liquid Height, ft	HL	Equation 7.3.7	1.00
Average Liquid Height, ft	HL	Equation 7.3.6	8.75
Cone Tank Roof Slope, ft/ft	SR	Equation 7.3.9	0.0000
Cone Tank Roof Radius, ft	RR	Equation 7.3.10	N/A
Cone Tank Roof Height, ft	HR	Equation 7.3.10	N/A
Roof Outlets, ft	RO	Equation 7.3.7 + 7.3.10	0.0000
Vapor Space Volume, ft ³	VV	Equation 7.3.10	18.75
Vapor Space Volume, ft ³	VV	Equation 7.3	1031.44
Average Daily Maximum Ambient Temperature, °F	TAM	Table 7.3.1	59.17
Average Daily Maximum Ambient Temperature, °F	TAM	Table 7.3.1	59.17
Average Daily Ambient Temperature Range, °F	ATA	Table 7.3.1	24.47
Average Daily Ambient Temperature Range, °F	ATA	Table 7.3.1	24.47
Average Daily Ambient Temperature, °F	TAA	Table 7.3.1	59.17
Average Daily Ambient Temperature, °F	TAA	Table 7.3.1	59.17
Task Roof Solar Absorptance, dimensionless	AS	Table 7.3.4	N/A
Task Shell Solar Absorptance, dimensionless	AS	Table 7.3.4	N/A
Average Daily Vapor Temperature Range, °F	ATV	Equation 7.3.1 + 7.3.8 + 7.3.1	5.00
Average Daily Liquid Surface Temperature, °F	TLA	Equation 7.3.1 + 7.3.8 + 7.3.1	59.67
Average Daily Maximum Liquid Surface Temperature, °F	TLA	Table 7.3.17	59.67
Average Daily Minimum Liquid Surface Temperature, °F	TLA	Table 7.3.17	59.67
Liquid Bulk Temperature, °F	TL	Equation 7.3.1 + 7.3.1	59.67
Average Vapor Temperature, °F	TV	Equation 7.3.1 + 7.3.1	59.67
Vapor Pressure at Avg. Daily Liquid Surf. Temp., mmHg	PVL	Equation 7.3.1 + 7.3.1	0.8623
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., mmHg	PVL	Equation 7.3.1 + 7.3.1	0.8623
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., mmHg	PVL	Equation 7.3.1 + 7.3.1	0.8623
Vapor Density, lb/ft ³	VD	Equation 7.3.2	0.0030
Daily Vapor Pressure range, mmHg	DPV	Equation 7.3	0.0000
Weather Vent Pressure Setting, mmHg	PPV	N/A	0.03
Weather Vent Vacuum Setting, mmHg	PPV	N/A	-0.03
Presence of Vapor Space at Normal Conditions, mmHg	PT	Equation 7.3.1	0
Weather Vent Pressure Setting Range, mmHg	APV	Equation 7.3.10	0.00
Ambient Pressure, mmHg	PA	Table 7.3.1	14.50
Vapor Space Expansion Factor	SE	Equation 7.3.1 + 7.3.1	0.0000
Vent Vapor Expansion Factor	SE	Equation 7.3.1	0.751
Roof Workable Load Threshold, ft ²	SL	Equation 7.3.9	112,754.83
Sum of Increases in Liquid Level, ft	SL	Equation 7.3.7	112,754.83
Annual Turnover	N	Equation 7.3.6	88.60
Monthly Loss Turnover Factor	MO	Equation 7.3.6	6.80
Monthly Loss Product Factor	MP	Equation 7.3.6	1.00
Loss Correction Factor	CS	Equation 7.3.6 + 7.3.1	1.00
Uncontrolled Emissions			
Monthly Loss, lb/yr	LS	Equation 7.3	0.0000
Monthly Loss, lb/yr	LV	Equation 7.3	118.6148
Total Losses, lb/yr	LT	Equation 7.3	118.6148
Total Losses, lb/yr	LT	N/A	0.0000
Avg. Daily Total Losses, lb/day	LAVD	Annualized Daily Average	0.3250
Avg. Hourly Total Losses, lb/hr	LAVD	Annualized Hourly Average	0.0138

Speciated Emissions	Vapor with	Uncontrolled	With
Chlorine Gas	0.010%	1.40E-05	1.40E-05
Phenol	0.000%	0.0000	0.0000
Chlorine	0.000%	0.0000	0.0000
Hydrogen Sulfide	0.000%	0.0000	0.0000
Ammonia	0.000%	0.0000	0.0000
Formaldehyde	0.000%	0.0000	0.0000
Hydrogen	0.000%	0.0000	0.0000
Hydrogen Chloride	0.000%	0.0000	0.0000
Hydrogen Fluoride	0.000%	0.0000	0.0000
Total VOC	0.000%	0.0000	0.0000

Tank Properties	
Tank Identification	Input
ICN	P-3
Tank Contents	NA
Discharging to	PRF Resin
Line	Atmosphere
Location for Calculation Purpose	2100
Tank/Road Type	Exume, OR
Underground?	Cons
Indoor?	Aboveground
Reather Vent Pressure Setting, psig	Indoor
Reather Vent Vacuum Setting, psig	0.02
Pressure of Vapor Space at Normal Condition, psig	-5.02
Tank Vapor Released and Flashies Occurs?	Pressure of Vapor Space at Normal Condition, psig
Emision Control Method	Tank Vapor Released and Flashies Occurs?
Emision Control Efficiency	No
	No Control

Tank Parameters	Input
Diameter, ft	18.37
Shell Height or Length, ft	19.00
Nominal Capacity, gal	12,006
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, °F	77
Measured Maximum Liquid Bulk Temperature, °F	77
Measured Minimum Liquid Bulk Temperature, °F	77
Maximum Number of Heating Cycles per Year	52

[illegible]

Speciated Emissions	Vapor wt%	Uncontrolled	
		typ	lb/hr
Ethylene Glycol	0.018%	1,07E-05	2,65E-06
Phenol	5.21%	0.0001	0.0002
Ethanol	19.86%	0.0118	0.0027
Methyl Isobutyl Ketone	3.67%	0.0002	0.0006
Acetone	0.002%	0.0001	0.0001
Formaldehyde	0.10%	0.0001	0.0001
Methanol	5.80%	0.0041	0.0002
Methylene Glycol	2.82%	0.0002	0.0001
Unspeciated	5.96%	0.0002	0.0001
Total VOC	27.22%	0.0006	0.0027

Hexion, Inc.
Springfield Plant - Springfield, OR
SPN: 0102
FIN: P-10

Task Properties	Input
Task Identification	P-10
CUA	N/A
Task Contents	PPF Basin
Dispersible In	Ammonia
PPH	Flt10
Location for Calculation Parameters	Exhausts, OR
Task/Boat Type	Flt
Underway?	Always/never
Indoor?	Indoor
Boat/Raft Vent Pressure Setting, mmHg	0.03
Boat/Raft Vent Vacuum Setting, mmHg	-0.03
Presence of Vapor Space at Normal Conditions, mmHg	No
Task Vapor Release and Flaming Control?	No Control
Emission Control Method	No Control
Emission Control Efficiency	0

Task Parameters	Input
Diameter, ft	13.44
Boat Height to Liquid, ft	13.44
Normal Capacity, gal	20,000
Boat Point Color	Ammonia
Boat Insulated?	No
Boat Point Color	Ammonia
Boat Insulated?	No
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, °F	77
Measured Maximum Liquid Bulk Temperature, °F	77
Measured Minimum Liquid Bulk Temperature, °F	77
Maximum Number of Heating Cycles per Year	12

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.3.1.1

Parameter	Symbol	Reference Equation	Amount
Process Stream			PPF Basin
Type of Substance	O	Subst. Out	Organic Liquid
Theoretical air/fuel ratio	Q	Indet	1.943/0.05
Vapor Molecular Weight, lb/mol	MV	Indet	24.84
Vapor Pressure Coefficient A	A	Indet	—
Vapor Pressure Coefficient B	B	Indet	—
Vapor Pressure Coefficient C	C	Indet	—
Effusion Diameter, ft	DE	Equation 7.3.1.6	12.48
Effusion Height, ft	HE	Equation 7.3.1.5	22.00
Maximum Liquid Height, ft	HL	Equation 7.3.7	21.00
Minimum Liquid Height, ft	HL	Equation 7.3.7	1.00
Average Liquid Height, ft	HL	Equation 7.3.6	10.50
Cone Tank Roof Slope, ft/ft	SR	Equation 7.3.9	0.0000
Cone Tank Roof Radius, ft	RR	Equation 7.3.10	N/A
Cone Tank Roof Height, ft	RR	Equation 7.3.10	N/A
Roof Outlets, ft	RO	Equation 7.3.7 + 7.3.10	0.0000
Vapor Space Volume, ft ³	VS	Equation 7.3.8	12.00
Vapor Space Volume, ft ³	VS	Equation 7.3	1450.07
Average Daily Maximum Ambient Temperature, °F	TAM	Table 7.3.2	50.17
Average Daily Maximum Ambient Temperature, °F	TAM	Table 7.3.2	52.47
Average Daily Ambient Temperature Range, °F	ATA	Equation 7.3.1	20.31
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.3.2	1204
Average Daily Ambient Temperature, °F	TAA	Equation 7.3.9	52.47
Task Roof Solar Absorptance, dimensionless	AS	Table 7.3.4	N/A
Task Shell Solar Absorptance, dimensionless	AS	Table 7.3.4	N/A
Average Daily Vapor Temperature Range, °F	ATV	Equation 7.2.7, 7.3.1, 7.3.2	5.30
Average Daily Liquid Surface Temperature, °F	TLS	Equation 7.2.7, 7.3.1, 7.3.2	156.47
Average Daily Maximum Liquid Surface Temperature, °F	TLM	Equation 7.3.17	156.47
Average Daily Minimum Liquid Surface Temperature, °F	TLM	Equation 7.3.17	156.47
Liquid Bulk Temperature, °F	TL	Equation 7.3.1, 7.3.2	156.47
Average Vapor Temperature, °F	TV	Equation 7.3.1, 7.3.2	156.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., mmHg	PVL	Equation 7.2.5, 7.2.6	0.8623
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., mmHg	PVL	Equation 7.2.5, 7.2.6	0.8623
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., mmHg	PVL	Equation 7.2.5, 7.2.6	0.8623
Vapor Density, lb/ft ³	VD	Equation 7.2.2	0.0030
Daily Vapor Pressure range, mmHg	DPV	Equation 7.3	0.0000
Boat/Raft Vent Pressure Setting, mmHg	PPV	N/A	0.03
Boat/Raft Vent Vacuum Setting, mmHg	PPV	N/A	-0.03
Presence of Vapor Space at Normal Conditions, mmHg	PT	Equation 7.3.11	0
Boat/Raft Vent Pressure Setting Range, mmHg	PPV	Equation 7.3.10	0.30
Ambient Pressure, mmHg	PA	Table 7.3.2	14.50
Vapor Space Expansion Factor	SE	Equation 7.3.1, 7.3.2	0.0000
Vertical Vapor Expansion Factor	ES	Equation 7.3.1	0.7777
Net Workable Loss Throughput, ft ³	WGL	Equation 7.3.9	167075.98
Sum of Increases in Liquid Level, ft	TL	Equation 7.3.7	1374.48
Annual Turnover	N	Equation 7.3.6	88.70
Monthly Loss Turnover Factor	ML	Equation 7.3.5	0.00
Monthly Loss Product Factor	MP	Equation 7.3.5	1.00
Level Setting Correction Factor	CS	Equation 7.40, 7.41	1.00
Uncontrolled Emissions			
Storage Storage Loss, lb/yr	LS	Equation 7.3	0.0000
Monthly Loss, lb/yr	ML	Equation 7.3.6	200.1124
Total Losses, lb/yr	LT	Equation 7.3	200.11
Total Losses, lb/yr	LT	N/A	0.1000
Avg. Daily Total Losses, lb/day	LWD	Annualized Daily Average	0.5510
Avg. Hourly Total Losses, lb/hr	LWD	Annualized Hourly Average	0.0230

Speciated Emissions	Vapor with	Uncontrolled	lb/yr
Chlorine Gas	0.010%	1.81E-05	6.13E-08
Phenol	0.000%	0.0000	0.0000
Chlorine	13.860%	0.0000	0.0000
Hydrogen Sulfide	0.000%	0.0000	0.0000
Ammonia	0.000%	0.0000	0.0000
Formaldehyde	0.000%	0.0000	0.0000
Hydrogen	0.860%	0.0000	0.0000
Hydrogen Chloride	0.000%	0.0000	0.0000
Hydrofluoric	0.000%	0.0000	0.0000
Total VOC	27.220%	0.0000	0.0000

Hexion, Inc.
Springfield Plant - Springfield, OR
SPN: 0103
FIN: R-1

Task Properties	Input
Task Identification	R-1
CUA	N/A
Task Contents	PPF Bleach
Dispersible In	Dispersible
PM	PM10
Location for Calculation Parameters	Exhausts, OR
Task/Reel Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Weather Vent Pressure Setting, mmHg	0.03
Weather Vent Vacuum Setting, mmHg	-0.02
Presence of Vapor Space at Normal Conditions, mmHg	0
Task Vapor Release and Flaming Coeffs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Task Parameters	Input
Diameter, ft	4.68
Reel Height to Liquid, ft	26.00
Normal Capacity, gal	13,372
Reel Painted?	Yes
Shift Prior Condition	None
Reel Insulated?	Yes
Reel Paint Color	White
Reel Condition	Average
Reel Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, °F	
Measured Maximum Liquid Bulk Temperature, °F	
Measured Minimum Liquid Bulk Temperature, °F	
Maximum Number of Heating Cycles per Year	262

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.1

Parameter	Symbol	Reference Equation	Amount
Process Stream			PPF Bleach
Type of Substance	O	Subst. Out	Organic Liquid
Theoretical Volatility		Subst.	160,874.1
Vapor Molecular Weight, lb/mol	MV	Subst.	24.84
Vapor Pressure Coefficient A	A	Subst.	24.84
Vapor Pressure Coefficient B	B	Subst.	---
Vapor Pressure Coefficient C	C	Subst.	---
Effusion Diameter, ft	DE	Equation 7.1-6	4.68
Effusion Height, ft	HE	Equation 7.1-5	25.00
Maximum Liquid Height, ft	HL	Equation 7.1-7	19.00
Minimum Liquid Height, ft	HL	Equation 7.1-7	1.00
Average Liquid Height, ft	HL	Equation 7.1-6	9.50
Cone Tank Roof Slope, ft/ft	SR	Equation 7.1-8	0.0000
Cone Tank Roof Radius, ft	RR	Equation 7.1-20	N/A
Cone Tank Roof Height, ft	HR	Equation 7.1-20	N/A
Roof Outlets, ft	RO	Equation 7.1-7 + 7.1-18	0.0000
Vapor Space Volume, ft ³	VVS	Equation 7.1-9	11.00
Vapor Space Volume, ft ³	VVS	Equation 7.1-9	188.47
Average Daily Maximum Ambient Temperature, ft	TAM	Table 7.1-2	59.17
Average Daily Maximum Ambient Temperature, ft	TAM	Table 7.1-2	59.17
Average Daily Ambient Temperature Range, ft	ATA	Table 7.1-2	24.47
Average Daily Ambient Temperature, ft	ATA	Equation 7.1-1	26.31
Average Daily Ambient Temperature, ft	ATA	Equation 7.1-2	12.94
Task Roof Solar Absorptance, dimensionless	AS	Table 7.1-4	0.26
Task Steel Solar Absorptance, dimensionless	AS	Table 7.1-4	0.26
Average Daily Vapor Temperature Range, ft	ATV	Equation 7.2-1, 8, 8-1	20.00
Average Daily Liquid Surface Temperature, ft	TLS	Equation 7.2-1, 8, 8-1	51.13
Average Daily Maximum Liquid Surface Temperature, ft	TLM	Equation 7.2-1, 8-1	59.00
Average Daily Minimum Liquid Surface Temperature, ft	TLM	Equation 7.2-1, 8-1	51.13
Liquid Bulk Temperature, ft	TL	Equation 7.3-1, 8-2	51.13
Average Vapor Temperature, ft	TV	Equation 7.3-1, 8-1	54.51
Vapor Pressure at Avg. Daily Liquid Surf. Temp., mmHg	PVL	Equation 7.2-1, 2-1, 2-2	0.8623
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., mmHg	PVM	Equation 7.2-1, 2-1, 2-2	0.8623
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., mmHg	PVM	Equation 7.2-1, 2-1, 2-2	0.8623
Vapor Density, lb/ft ³	VD	Equation 7.2-2	0.0011
Daily Vapor Pressure range, mmHg	DPV	Equation 7.3-1	0.0000
Weather Vent Pressure Setting, mmHg	PPV	N/A	0.03
Weather Vent Vacuum Setting, mmHg	PPV	N/A	-0.02
Presence of Vapor Space at Normal Conditions, mmHg	PT	Equation 7.1-1	0
Weather Vent Pressure Setting Range, mmHg	PPV	Equation 7.1-2	0.36
Ambient Pressure, mmHg	PA	Table 7.1-2	14.50
Vapor Space Expansion Factor	SE	Equation 7.3-1, 8-1, 8-2	0.2362
Vertical Vapor Expansion Factor	SE	Equation 7.3-1	0.7975
Reel Working Loss Throughput, ft ³	WGL	Equation 7.1-19	24,116.48
Sum of Increases in Liquid Level, ft	SL	Equation 7.1-7	1,048.18
Accum. Tonnage	N	Equation 7.1-6	88.48
Working Loss Throughput Factor	WL	Equation 7.1-20	4.00
Working Loss Throughput Factor	WL	Equation 7.1-20	1.00
Level Setting Correction Factor	CS	Equation 7.1-1, 7-1	1.00
Uncontrolled Emissions			
Working Loss, lb/yr	WL	Equation 7.1-20	26,812.91
Total Losses, lb/yr	TL	Equation 7.1	26.82
Total Losses, lb/yr	TL	N/A	0.0000
Avg. Daily Total Losses, lb/day	LWD	Accumulated Daily Average	0.0000
Avg. Hourly Total Losses, lb/hr	LWD	Accumulated Hourly Average	0.0010

Speciated Emissions	Vapor with	Uncontrolled	With
Chlorine Gas	0.0000	2,786.08	0.0000
Fluorine	0.0000	0.0000	0.0000
Hydrogen Chloride	0.0000	0.0000	0.0000
Hydrogen Fluoride	0.0000	0.0000	0.0000
Hydrogen Sulfide	0.0000	0.0000	0.0000
Hydrogen Cyanide	0.0000	0.0000	0.0000
Hydrogen Peroxide	0.0000	0.0000	0.0000
Hydrogen Sulfide	0.0000	0.0000	0.0000
Hydrogen Cyanide	0.0000	0.0000	0.0000
Total VOC	0.0000	0.0000	0.0000

Hexion, Inc.
Springfield Plant - Springfield, OR
SPN: 0104
FIN: R-2

Task Properties	Input
Task Identification	R-2
CUA	N/A
Task Contents	PPF Bleach
Dispersible In	Dispersible
PM	F104
Location for Calculation Parameters	Exterior, OR
Task/Reel Type	Flat
Underlayment?	None/unknown
Indoor?	Outdoor
Weather Vent Pressure Setting, mmHg	0.03
Weather Vent Vacuum Setting, mmHg	-0.03
Presence of Vapor Space at Normal Condition, mmHg	0
Task Vapor Release and Flaming Coeff?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Task Parameters	Input
Diameter, ft	4.65
Reel Height to Length, ft	1.60
Normal Capacity, gal	4,100
Reel Paint Color	White
Reel Prior Condition	None
Reel Insulated?	No
Reel Paint Color	White
Reel Prior Condition	Average
Reel Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, °F	
Measured Maximum Liquid Bulk Temperature, °F	
Measured Minimum Liquid Bulk Temperature, °F	
Maximum Number of Heating Cycles per Year	263

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.3.1.1

Parameter	Symbol	Reference Equation	Amount
Process Stream			PPF Bleach
Type of Substance	O	Subst. Out	Organic Liquid
Theoretical Volatility		Subst.	253.826
Vapor Molecular Weight, lb/mol	MV	Subst.	24.84
Vapor Pressure Coefficient A	A	Subst.	24.84
Vapor Pressure Coefficient B	B	Subst.	—
Vapor Pressure Coefficient C	C	Subst.	—
Effusion Diameter, ft	DE	Equation 7.3.6	6.65
Effusion Height, ft	HE	Equation 7.3.5	15.05
Maximum Liquid Height, ft	HL	Equation 7.3.7	15.05
Minimum Liquid Height, ft	HL	Equation 7.3.7	1.00
Average Liquid Height, ft	HL	Equation 7.3.6	7.25
Cone Tank Roof Slope, ft/ft	SR	Equation 7.3.8	0.3000
Cone Tank Roof Radius, ft	RR	Equation 7.3.9	30.6
Cone Tank Roof Height, ft	RR	Equation 7.3.9	30.6
Roof Outcrop, ft	RO	Equation 7.3.7 + 7.3.9	0.3000
Vapor Space Volume, ft ³	VS	Equation 7.3.8	0.00
Vapor Space Volume, ft ³	VV	Equation 7.3	112.79
Average Daily Maximum Ambient Temperature, ft	TAM	Table 7.3.2	592.17
Average Daily Maximum Ambient Temperature, ft	TAM	Table 7.3.2	592.47
Average Daily Ambient Temperature Range, ft	ATA	Equation 7.3.1	26.31
Average Daily Ambient Temperature, ft	TAA	Equation 7.3.2	1294
Average Daily Ambient Temperature, ft	TAA	Equation 7.3.2	524.43
Task Roof Solar Absorptance, dimensionless	AS	Table 7.3.4	0.25
Task Steel Solar Absorptance, dimensionless	AS	Table 7.3.4	0.25
Average Daily Vapor Temperature Range, ft	ATV	Equation 7.7.1-8.1	20.40
Average Daily Liquid Surface Temperature, ft	TSL	Equation 7.7.1-8.1	54.43
Average Daily Maximum Liquid Surface Temperature, ft	TSL	Equation 7.7.1-8.1	59.09
Average Daily Minimum Liquid Surface Temperature, ft	TSL	Equation 7.7.1-8.1	51.04
Liquid Bulk Temperature, ft	TL	Equation 7.3.1-8.1	51.32
Average Vapor Temperature, ft	TV	Equation 7.3.1-8.1	54.71
Vapor Pressure at Avg. Daily Liquid Surf. Temp., mmHg	PVL	Equation 7.2.1-2.6	0.8623
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., mmHg	PVL	Equation 7.2.1-2.6	0.8623
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., mmHg	PVL	Equation 7.2.1-2.6	0.8623
Vapor Density, lb/ft ³	VD	Equation 7.2.2	0.001
Daily Vapor Pressure range, mmHg	DPV	Equation 7.3	0.0000
Weather Vent Pressure Setting, mmHg	PPV	N/A	0.03
Weather Vent Vacuum Setting, mmHg	PPV	N/A	-0.03
Presence of Vapor Space at Normal Condition, mmHg	PT	Equation 7.4.1	0
Weather Vent Pressure Setting Range, mmHg	PPV	Equation 7.3.2	0.36
Ambient Pressure, mmHg	PA	Table 7.3.2	14.50
Vapor Space Expansion Factor	SE	Equation 7.5.1-7.5.2	0.2362
Vertical Vapor Expansion Factor	SE	Equation 7.5.1	0.2373
Reel Working Loss Throughput, ft ³	WGL	Equation 7.3.9	30774.92
Sum of Increases in Liquid Level, ft	SL	Equation 7.3.7	399.38
Annual Turnover	N	Equation 7.3.6	71.38
Working Loss Turnover Factor	WN	Equation 7.3.5	0.30
Working Loss Product Factor	WP	Equation 7.3.6	1.00
Level Setting Correction Factor	CS	Equation 7.4.3-7.4.4	1.00
Uncontrolled Emissions			
Working Storage Loss, lb/yr	LS	Equation 7.3	7.2833
Working Loss, lb/yr	WL	Equation 7.3.6	61,402.4
Total Losses, lb/yr	LT	Equation 7.3	61,410
Total Losses, lb/yr	LT	N/A	0.0047
Avg. Daily Total Losses, lb/day	LWD	Annualized Daily Average	0.1683
Avg. Hourly Total Losses, lb/hr	LWD	Annualized Hourly Average	0.0070

Speciated Emissions	Vapor with	Uncontrolled	lb/yr
Chlorine Gas	0.010%	0.000	1.010
Phenol	0.000%	0.000	0.000
Chlorine	0.000%	0.000	0.000
Hydrochloric Acid	0.000%	0.000	0.000
Hydrogen	0.000%	0.000	0.000
Formaldehyde	0.000%	0.000	0.000
Hydrogen	0.000%	0.000	0.000
Hydrogen Gas	0.000%	0.000	0.000
Hydrogen	0.000%	0.000	0.000
Total VOC	0.000%	0.000	0.000

tion, Inc.
Oboil Plant

Tank Parameters	Input
Diameter, ft	6.65
Shell Height or Length, ft	16.00
Nominal Capacity, gal	4,160
Shell Paint Color	white
Shell Paint Finish	smooth
Shell Insulated?	No
Roof Paint Color	white
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, °F	77
Measured Maximum Liquid Bulk Temperature, °F	77
Measured Minimum Liquid Bulk Temperature, °F	77
Maximum Number of Heating Cycles per Year	52

Tank Parameters	Input
Diameter, ft	6.65
Shell Height or Length, ft	16.00
Nominal Capacity, gal	4,160
Shell Paint Color	white
Shell Paint Finish	smooth
Shell Insulated?	No
Roof Paint Color	white
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, °F	77
Measured Maximum Liquid Bulk Temperature, °F	77
Measured Minimum Liquid Bulk Temperature, °F	77
Maximum Number of Heating Cycles per Year	52

Tank Parameters	Input
Diameter, ft	6.65
Shell Height or Length, ft	16.00
Nominal Capacity, gal	4,160
Shell Paint Color	white
Shell Paint Finish	smooth
Shell Insulated?	No
Roof Paint Color	white
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, °F	77
Measured Maximum Liquid Bulk Temperature, °F	77
Measured Minimum Liquid Bulk Temperature, °F	77
Maximum Number of Heating Cycles per Year	52

Hexion, Inc.
Springfield Plant - Springfield, OR
SPN: 0106
FIN: R-4

Task Properties	Input
Task Identification	R-4
CUA	N/A
Task Contents	PPF Blends
Dispersible In.	Asphalts
PM	PMMA
Location for Calculation Parameters	Exterior, OR
Task/Blend Type	Flat
Underlayment?	Asph/Flt
Insul?	Outside
Weather Vent Pressure Setting, mmHg	0.03
Weather Vent Vacuum Setting, mmHg	-0.03
Presence of Vapor Space at Normal Condition, mmHg	No
Task Vapor Material and Flaming Concern?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Task Parameters	Input
Diameter, ft.	0.65
Roof Height to Leaky ft., ft.	14.00
Normal Capacity, gal.	4,100
Roof Pitch	0/12
Roof Pitch Condition	Asph/Flt
Roof Insulation?	No
Roof Pitch Color	White
Roof Pitch Condition	Asph/Flt
Roof Insulation?	No
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, °F	77
Measured Maximum Liquid Bulk Temperature, °F	77
Measured Minimum Liquid Bulk Temperature, °F	77
Maximum Number of Heating Cycles per Year	12

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.3.1.1

Parameter	Symbol	Reference Equation	Amount
Process Stream			PPF Blends
Type of Substance	O	Subst. Out.	Organic Liquid
Theoretical Volatility		Subst.	253.825
Vapor Molecular Weight, lb./mole	MV	Subst.	24.84
Vapor Pressure Coefficient A	A	Subst.	24.84
Vapor Pressure Coefficient B	B	Subst.	—
Vapor Pressure Coefficient C	C	Subst.	—
Effusion Diameter, ft.	DE	Equation 7.3.1.6	0.65
Effusion Height, ft.	HE	Equation 7.3.1.7	15.00
Maximum Liquid Height, ft.	HL	Equation 7.3.1.7	15.00
Minimum Liquid Height, ft.	HL	Equation 7.3.1.7	1.00
Average Liquid Height, ft.	HL	Equation 7.3.1.6	7.25
Cone Tank Roof Slope, ft/ft	SR	Equation 7.3.1.8	0.0000
Cone Tank Roof Radius, ft.	RR	Equation 7.3.1.8	N/A
Cone Tank Roof Height, ft.	RR	Equation 7.3.1.8	N/A
Roof Outcrop, ft.	RO	Equation 7.3.1.8	0.0000
Vapor Space Volume, ft ³	VS	Equation 7.3.1.8	0.00
Vapor Space Volume, ft ³	VS	Equation 7.3.1	112.79
Average Daily Maximum Ambient Temperature, ft.	TAM	Table 7.3.1.1	59.17
Average Daily Maximum Ambient Temperature, ft.	TAM	Table 7.3.1.1	59.17
Average Daily Ambient Temperature Range, ft.	ATR	Table 7.3.1.1	20.11
Average Daily Ambient Temperature, ft.	TAD	Table 7.3.1.1	129.4
Average Daily Ambient Temperature, ft.	TAD	Table 7.3.1.1	129.4
Task Roof Solar Absorptance, dimensionless	AS	Table 7.3.1.4	0.25
Task Shell Solar Absorptance, dimensionless	AS	Table 7.3.1.4	0.25
Average Daily Vapor Temperature Range, ft.	ATV	Equation 7.3.1.4, B-1	20.10
Average Daily Liquid Surface Temperature, ft.	TAL	Equation 7.3.1.4, B-2	126.49
Average Daily Maximum Liquid Surface Temperature, ft.	TAL	Equation 7.3.1.4	126.47
Average Daily Minimum Liquid Surface Temperature, ft.	TAL	Equation 7.3.1.4	126.47
Liquid Bulk Temperature, ft.	TL	Equation 7.3.1.4, B-2	126.47
Average Vapor Temperature, ft.	TV	Equation 7.3.1.4, B-2	127.11
Vapor Pressure at Avg. Daily Liquid Surf. Temp., mmHg	PVL	Equation 7.3.1.4, B-2	0.0023
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., mmHg	PVL	Equation 7.3.1.4, B-2	0.0023
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., mmHg	PVL	Equation 7.3.1.4, B-2	0.0023
Vapor Density, lb./ft ³	VD	Equation 7.3.1.4	0.0011
Daily Vapor Pressure range, mmHg	DPV	Equation 7.3.1	0.0000
Weather Vent Pressure Setting, mmHg	PPV	N/A	0.03
Weather Vent Vacuum Setting, mmHg	PPV	N/A	-0.03
Presence of Vapor Space at Normal Condition, mmHg	PT	Equation 7.3.1.1	0
Weather Vent Pressure Setting Range, mmHg	PPV	Equation 7.3.1.1	0.00
Ambient Pressure, mmHg	PA	Table 7.3.1.1	14.70
Vapor Space Expansion Factor	SE	Equation 7.3.1.1, B-1	0.0000
Vent Vapor Expansion Factor	SE	Equation 7.3.1.1	0.0000
Net Workable Loss Throughput, ft ³	WGL	Equation 7.3.1.1	30771.42
Sum of Increases in Liquid Level, ft.	IL	Equation 7.3.1.1	100.00
Actual Turnover	AT	Equation 7.3.1.1	71.38
Working Loss Turnover Factor	WLF	Equation 7.3.1.1	0.00
Working Loss Product Factor	WLP	Equation 7.3.1.1	0.00
Level Setting Correction Factor	CS	Equation 7.3.1.1, B-1	1.00
Uncontrolled Emissions			
Working Storage Loss, lb./yr.	LS	Equation 7.3.1	7200.00
Working Loss, lb./yr.	WL	Equation 7.3.1	61.1944
Total Losses, lb./yr.	LT	Equation 7.3.1	62.45
Total Losses, lb./yr.	LT	N/A	0.0000
Avg. Daily Total Losses, lb./day	LWD	Annualized Daily Average	0.1700
Avg. Hourly Total Losses, lb./hr	LWD	Annualized Hourly Average	0.0070

Speciated Emissions	Vapor with	Uncontrolled	With
Chlorine Gas	0.0000	0.0000	0.0000
Fluorine	0.0000	0.0000	0.0000
Hydrogen Chloride	0.0000	0.0000	0.0000
Hydrogen Fluoride	0.0000	0.0000	0.0000
Hydrogen Sulfide	0.0000	0.0000	0.0000
Hydrogen Cyanide	0.0000	0.0000	0.0000
Hydrogen Peroxide	0.0000	0.0000	0.0000
Hydrogen Sulfide	0.0000	0.0000	0.0000
Hydrogen Cyanide	0.0000	0.0000	0.0000
Hydrogen Peroxide	0.0000	0.0000	0.0000
Total VOC	0.0000	0.0000	0.0000

Hexion, Inc.
Springfield Plant - Springfield, OR
SPN 2107
FIN ST-5

Task Properties	Input
Task Identification	ST-5
CUA	N/A
Task Contents	PPF Bleach
Discharge to	Atmosphere
PPE	PPE9
Location for Calculation Parameters	Exterior, OR
Task/Reel Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Weather Vent Pressure Setting, mmHg	0.03
Weather Vent Vacuum Setting, mmHg	-0.03
Presence of Vapor Space at Normal Condition, mmHg	No
Task Vapor Release and Flaming Control?	No Control
Emission Control Method	
Emission Control Efficiency	0

Task Parameters	Input
Diameter, ft	3.04
Reel Height to Liquid, ft	12.00
Normal Capacity, gal	12,183
Reel Point Color	Shiny/No Steel
Reel Point Condition	Average
Reel Insulated?	No
Reel Point Color	Shiny/No Steel
Reel Point Condition	Average
Reel Insulated?	No
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, °F	77
Measured Maximum Liquid Bulk Temperature, °F	77
Measured Minimum Liquid Bulk Temperature, °F	77
Maximum Number of Heating Cycles per Year	12

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.3.1.1

Parameter	Symbol	Reference Equation	Amount
Process Stream			PPF Bleach
Type of Substance	O	Subst. Out	Organic Liquid
Theoretical Airflow, ft ³ /min	Q	Eqn. 7.3.1.1	708.427
Vapor Molecular Weight, lb/mol	MV	Eqn. 7.3.1.1	24.84
Vapor Pressure Coefficient A	A	Eqn. 7.3.1.1	Eqn. 7.3.1.1
Vapor Pressure Coefficient B	B	Eqn. 7.3.1.1	Eqn. 7.3.1.1
Vapor Pressure Coefficient C	C	Eqn. 7.3.1.1	Eqn. 7.3.1.1
Effusion Diameter, ft	DE	Equation 7.3.1.1	0.31
Effusion Height, ft	HE	Equation 7.3.1.1	22.00
Maximum Liquid Height, ft	HL	Equation 7.3.1.1	21.00
Minimum Liquid Height, ft	HL	Equation 7.3.1.1	0.00
Average Liquid Height, ft	HL	Equation 7.3.1.1	10.50
Cone Tank Roof Height, ft	HR	Equation 7.3.1.1	0.000
Cone Tank Roof Radius, ft	RR	Equation 7.3.1.1	0.00
Cone Tank Roof Height, ft	HR	Equation 7.3.1.1	0.000
Roof Diameter, ft	DR	Equation 7.3.1.1	0.000
Vapor Space Volume, ft ³	VS	Equation 7.3.1.1	12.00
Vapor Space Volume, ft ³	VS	Equation 7.3.1.1	12.00
Average Daily Maximum Ambient Temperature, °F	TAM	Table 7.3.1.1	59.14
Average Daily Minimum Ambient Temperature, °F	TAM	Table 7.3.1.1	59.14
Average Daily Maximum Ambient Temperature, °F	TAM	Table 7.3.1.1	59.14
Average Daily Ambient Temperature Range, °F	ΔTA	Equation 7.3.1.1	0.00
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.3.1.1	1,000
Average Daily Ambient Temperature, °F	TAM	Equation 7.3.1.1	59.14
Task Roof Solar Absorptance, dimensionless	αR	Table 7.3.1.1	0.00
Task Shell Solar Absorptance, dimensionless	αS	Table 7.3.1.1	0.00
Average Daily Vapor Temperature Range, °F	ΔTV	Equation 7.3.1.1	0.00
Average Daily Liquid Surface Temperature, °F	TLS	Equation 7.3.1.1	59.14
Average Daily Maximum Liquid Surface Temperature, °F	TLS	Equation 7.3.1.1	59.14
Average Daily Minimum Liquid Surface Temperature, °F	TLS	Equation 7.3.1.1	59.14
Liquid Bulk Temperature, °F	TL	Equation 7.3.1.1	59.14
Average Vapor Temperature, °F	TV	Equation 7.3.1.1	59.14
Vapor Pressure at Avg. Daily Liquid Surf. Temp., mmHg	PVL	Equation 7.3.1.1	0.000
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., mmHg	PVL	Equation 7.3.1.1	0.000
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., mmHg	PVL	Equation 7.3.1.1	0.000
Vapor Density, lb/ft ³	VD	Equation 7.3.1.1	0.000
Daily Vapor Pressure range, mmHg	ΔVP	Equation 7.3.1.1	0.000
Weather Vent Vacuum Setting, mmHg	PPV	Eqn. 7.3.1.1	0.03
Presence of Vapor Space at Normal Condition, mmHg	PT	Equation 7.3.1.1	0.03
Weather Vent Vacuum Setting Range, mmHg	ΔPPV	Equation 7.3.1.1	0.00
Ambient Pressure, mmHg	PA	Table 7.3.1.1	14.70
Vapor Space Expansion Factor	KE	Equation 7.3.1.1	0.000
Venturi Vapor Expansion Factor	KE	Equation 7.3.1.1	0.000
Reel Working Loss Throughput, ft ³ /min	WL	Equation 7.3.1.1	100,000
Sum of Increases in Liquid Level, ft	ΣN	Equation 7.3.1.1	0.00
Annual Turnover	N	Equation 7.3.1.1	0.00
Reel Loss Turnover Factor	RL	Equation 7.3.1.1	0.00
Reel Loss Product Factor	RP	Equation 7.3.1.1	0.00
Reel Loss Correction Factor	RC	Equation 7.3.1.1	0.00
Uncontrolled Emissions			
Operating Storage Loss, lb/yr	LS	Equation 7.3.1.1	0.000
Reel Loss, lb/yr	RL	Equation 7.3.1.1	100,000
Total Losses, lb/yr	LT	Equation 7.3.1.1	100,000
Total Losses, lb/yr	LT	Eqn. 7.3.1.1	100,000
Avg. Daily Total Losses, lb/day	LWD	Equation 7.3.1.1	0.000
Avg. Hourly Total Losses, lb/hr	LWD	Equation 7.3.1.1	0.000

Speciated Emissions	Vapor with	Uncontrolled	With
Chlorine Gas	0.000%	0.000%	0.000%
Hydrogen	0.000%	0.000%	0.000%
Hydrogen Sulfide	0.000%	0.000%	0.000%
Hydrogen Cyanide	0.000%	0.000%	0.000%
Hydrogen Fluoride	0.000%	0.000%	0.000%
Hydrogen Chloride	0.000%	0.000%	0.000%
Hydrogen Bromide	0.000%	0.000%	0.000%
Hydrogen Iodide	0.000%	0.000%	0.000%
Hydrogen Nitrate	0.000%	0.000%	0.000%
Total VOC	0.000%	0.000%	0.000%

Tank Properties	
Tank Description	

Tank Parameters	Input
Diameter, ft	12.03
Shell Height or Length, ft	22.17
Nominal Capacity, gal	18,823
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, °F	77
Measured Maximum Liquid Bulk Temperature, °F	77
Measured Minimum Liquid Bulk Temperature, °F	77
Maximum Number of Heating Cycles per Year	52

Tank Parameters	Input
Diameter, ft	12.03
Shell Height or Length, ft	22.17
Nominal Capacity, gal	18,823
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, °F	77
Measured Maximum Liquid Bulk Temperature, °F	77
Measured Minimum Liquid Bulk Temperature, °F	77
Maximum Number of Heating Cycles per Year	52

Tank Parameters	Input
Diameter, ft	12.03
Shell Height or Length, ft	22.17
Nominal Capacity, gal	18,823
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, °F	77
Measured Maximum Liquid Bulk Temperature, °F	77
Measured Minimum Liquid Bulk Temperature, °F	77
Maximum Number of Heating Cycles per Year	52

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E75
FIN: U-2

Tank Properties	
Tank Identification	U-2
CIN	N/A
Tank Contents	UF Resin
Discharging to	Atmosphere
EPN	E75
Location for Calculation Purposes	Eugene, OR
Tank / Roof Type	Cone
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	10.50
Shell Height or Length, ft	19.00
Nominal Capacity, gal	12,306
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	UF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,554,347
Vapor Molecular Weight, lb/lbmol	MV	Input	20.73
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	10.50
Effective Height, ft	HE	Equation 1-15	19.00
Maximum Liquid Height, ft	HLX	Equation 1-37	18.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	8.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0625
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.1094
Vapor Space Outage, ft	HVO	Equation 1-16	10.61
Vapor Space Volume, ft ³	VV	Equation 1-3	918.61
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4306
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.8951
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	207764.39
Sum of Increases in Liquid Level, ft	ΣHQIL	Equation 1-37	2399.56
Annual Turnovers	N	Equation 1-36	141.15
Working Loss Turnover Factor	KN	Equation 1-35	0.38
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	127.8939
Total Losses, lb/yr	LT	Equation 1-1	127.89
Total Losses, tpy	LT	N/A	0.0639
Avg. Daily Total Losses, lb/day	LAvg	Annualized Daily Average	0.3504
Avg. Hourly Total Losses, lb/hr	LAvg	Annualized Hourly Average	0.0146

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Triethylamine	0.010%	6.11E-06	1.39E-06
Formaldehyde	7.54%	0.0048	0.0011
Methanol	10.95%	0.0070	0.0016
Methylene Glycol	0.59%	0.0004	0.0001
Hemiformal	0.18%	0.0001	0.0000
Total VOC	19.28%	0.0123	0.0028

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E76
FIN: U-4

Tank Properties	
Tank Identification	U-4
CIN	N/A
Tank Contents	UF Resin
Discharging to	Atmosphere
EPN	E76
Location for Calculation Purposes	Eugene, OR
Tank / Roof Type	Cone
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	12.72
Shell Height or Length, ft	20.00
Nominal Capacity, gal	19,010
Shell Paint Color	white
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	white
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Chilled
Measured Liquid Bulk Temperature, F	60.8
Measured Maximum Liquid Bulk Temperature, F	60.8
Measured Minimum Liquid Bulk Temperature, F	60.8
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	UF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	2,401,024
Vapor Molecular Weight, lb/mol	MV	Input	20.73
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	12.72
Effective Height, ft	HE	Equation 1-15	20.00
Maximum Liquid Height, ft	HLX	Equation 1-37	19.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0625
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.1325
Vapor Space Outage, ft	HVO	Equation 1-16	11.13
Vapor Space Volume, ft ³	VV	Equation 1-3	1414.50
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	0.25
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	0.25
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	20.09
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	518.21
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	520.47
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	520.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	520.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	515.95
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4306
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7074
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	320936.86
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2525.85
Annual Turnovers	N	Equation 1-36	140.32
Working Loss Turnover Factor	KN	Equation 1-35	0.38
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	24.0019
Working Loss, lb/yr	LW	Equation 1-35	196.8552
Total Losses, lb/yr	LT	Equation 1-1	220.86
Total Losses, tpy	LT	N/A	0.1104
Avg. Daily Total Losses, lb/day	LAvg	Annualized Daily Average	0.6051
Avg. Hourly Total Losses, lb/hr	LAvg	Annualized Hourly Average	0.0252

Speciated Emissions	Vapor wt%	Uncontrolled	
		tpy	lb/hr
Triethylamine	0.010%	1.05E-05	2.41E-06
Formaldehyde	7.54%	0.0093	0.0019
Methanol	10.95%	0.0121	0.0028
Methylene Glycol	0.59%	0.0007	0.0001
Hemiformal	0.18%	0.0002	0.0000
Total VOC	19.28%	0.0213	0.0049

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E77
FIN: U-5

Tank Properties	Input
Tank Identification	U-5
CIN	N/A
Tank Contents	UF Resin
Discharging to	Atmosphere
EPN	E77
Location for Calculation Purposes	Eugene, OR
Tank / Roof Type	Cone
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	12.72
Shell Height or Length, ft	20.00
Nominal Capacity, gal	19,010
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Chilled
Measured Bulk Temperature, F	60.8
Measured Maximum Liquid Bulk Temperature, F	60.8
Measured Minimum Liquid Bulk Temperature, F	60.8
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	UF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	2,401,024
Vapor Molecular Weight, lb/mol	MV	Input	20.73
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	12.72
Effective Height, ft	HE	Equation 1-15	20.00
Maximum Liquid Height, ft	HLX	Equation 1-37	19.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0625
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.1325
Vapor Space Outage, ft	HVO	Equation 1-16	11.13
Vapor Space Volume, ft ³	VV	Equation 1-3	1414.50
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	520.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	520.47
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	520.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	520.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	520.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4306
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.2974
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	320936.86
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2525.85
Annual Turnovers	N	Equation 1-36	140.32
Working Loss Turnover Factor	KN	Equation 1-35	0.38
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	195.1453
Total Losses, lb/yr	LT	Equation 1-1	195.15
Total Losses, tpy	LT	N/A	0.0976
Avg. Daily Total Losses, lb/day	LAvg	Annualized Daily Average	0.5346
Avg. Hourly Total Losses, lb/hr	LAvg	Annualized Hourly Average	0.0223

Speciated Emissions	Vapor wt%	Uncontrolled	
		tpy	lb/hr
Triethylamine	0.010%	9.32E-06	2.13E-06
Formaldehyde	7.54%	0.0074	0.0017
Methanol	10.95%	0.0107	0.0024
Methylene Glycol	0.59%	0.0006	0.0001
Hemiformal	0.18%	0.0002	0.0000
Total VOC	19.28%	0.0188	0.0043

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E78
FIN: U-6

Tank Properties	Input
Tank Identification	U-6
CIN	N/A
Tank Contents	UF Resin
Discharging to	Atmosphere
EPN	E78
Location for Calculation Purposes	Eugene, OR
Tank / Roof Type	Cone
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	12.75
Shell Height or Length, ft	22.00
Nominal Capacity, gal	21,011
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	UF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	2,653,763
Vapor Molecular Weight, lb/mol	MV	Input	20.73
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	12.75
Effective Height, ft	HE	Equation 1-15	22.00
Maximum Liquid Height, ft	HLX	Equation 1-37	21.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	10.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0625
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.1328
Vapor Space Outage, ft	HVO	Equation 1-16	12.13
Vapor Space Volume, ft ³	VV	Equation 1-3	1548.98
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4306
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7831
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	354719.69
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2778.43
Annual Turnovers	N	Equation 1-36	138.92
Working Loss Turnover Factor	KN	Equation 1-35	0.38
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	220.3188
Total Losses, lb/yr	LT	Equation 1-1	220.32
Total Losses, tpy	LT	N/A	0.1102
Avg. Daily Total Losses, lb/day	LAvg	Annualized Daily Average	0.6036
Avg. Hourly Total Losses, lb/hr	LAvg	Annualized Hourly Average	0.0252

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Triethylamine	0.010%	1.05E-05	2.40E-06
Formaldehyde	7.54%	0.0093	0.0019
Methanol	10.95%	0.0121	0.0028
Methylene Glycol	0.59%	0.0007	0.0001
Hemiformal	0.18%	0.0002	0.0000
Total VOC	19.28%	0.0212	0.0048

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E79
FIN: U-7

Tank Properties	
Tank Identification	U-7
CIN	N/A
Tank Contents	UF Resin
Discharging to	Atmosphere
EPN	E79
Location for Calculation Purposes	Eugene, OR
Tank / Roof Type	Cone
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	12.75
Shell Height or Length, ft	22.00
Nominal Capacity, gal	21,011
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	UF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	2,653,763
Vapor Molecular Weight, lb/mol	MV	Input	20.73
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	12.75
Effective Height, ft	HE	Equation 1-15	22.00
Maximum Liquid Height, ft	HLX	Equation 1-37	21.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	10.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0625
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.1328
Vapor Space Outage, ft	HVO	Equation 1-16	12.13
Vapor Space Volume, ft ³	VV	Equation 1-3	1548.98
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4306
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7851
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	354719.69
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2778.43
Annual Turnovers	N	Equation 1-36	138.92
Working Loss Turnover Factor	KN	Equation 1-35	0.38
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	220.1188
Total Losses, lb/yr	LT	Equation 1-1	220.32
Total Losses, tpy	LT	N/A	0.1102
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.6036
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0252

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Triethylamine	0.010%	1.05E-05	2.40E-06
Formaldehyde	7.54%	0.0093	0.0019
Methanol	10.95%	0.0121	0.0028
Methylene Glycol	0.59%	0.0007	0.0001
Hemiformal	0.18%	0.0002	0.0000
Total VOC	19.28%	0.0212	0.0048

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E80
FIN: U-8

Tank Properties	
Tank Identification	Input
CIN	U-8
Tank Contents	N/A
Discharging to	UF Resin
EPN	Atmosphere
Location for Calculation Purposes	E80
Tank / Roof Type	Eugene, OR
Underground?	Cone
Indoor?	Aboveground
Breather Vent Pressure Setting, psig	Outdoor
Breather Vent Vacuum Setting, psig	0.03
Pressure of Vapor Space at Normal Condition, psig	-0.03
Tank Vapor Balanced and Flashing Occurs?	0
Emission Control Method	No
Emission Control Efficiency	No Control
	0

Tank Parameters	
Diameter, ft	Input
Shell Height or Length, ft	12.75
Nominal Capacity, gal	22.00
Shell Paint Color	21,011
Shell Paint Condition	Stainless Steel
Shell Insulated?	Average
Roof Paint Color	Yes
Roof Paint Condition	Stainless Steel
Roof Insulated?	Average
Temperature Controlled or Atmospheric?	Yes
Measured Liquid Bulk Temperature, F	Atmospheric
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	UF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	2,653,763
Vapor Molecular Weight, lb/mol	MV	Input	20.73
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	12.75
Effective Height, ft	HE	Equation 1-15	22.00
Maximum Liquid Height, ft	HLX	Equation 1-37	21.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	10.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0625
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.1328
Vapor Space Outage, ft	HVO	Equation 1-16	12.13
Vapor Space Volume, ft ³	VV	Equation 1-3	1548.98
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4306
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7851
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	354719.69
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2778.43
Annual Turnovers	N	Equation 1-36	138.92
Working Loss Turnover Factor	KN	Equation 1-35	0.38
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	220.3188
Total Losses, lb/yr	LT	Equation 1-1	220.32
Total Losses, tpy	LT	N/A	0.1102
Avg. Daily Total Losses, lb/day	LAvg	Annualized Daily Average	0.6036
Avg. Hourly Total Losses, lb/hr	LAvg	Annualized Hourly Average	0.0252

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Triethylamine	0.010%	1.05E-05	2.40E-06
Formaldehyde	7.54%	0.0093	0.0019
Methanol	10.95%	0.0121	0.0028
Methylene Glycol	0.59%	0.0007	0.0001
Hemiformal	0.18%	0.0002	0.0000
Total VOC	19.28%	0.0212	0.0048

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E81
FIN: U-9

Tank Properties	
Tank Identification	Input
CIN	U-9
Tank Contents	N/A
Discharging to	UF Resin
EPN	Atmosphere
Location for Calculation Purposes	E81
Tank / Roof Type	Eugene, OR
Underground?	Cone
Indoor?	Aboveground
Breather Vent Pressure Setting, psig	Outdoor
Breather Vent Vacuum Setting, psig	0.03
Pressure of Vapor Space at Normal Condition, psig	-0.03
Tank Vapor Balanced and Flashing Occurs?	0
Emission Control Method	No
Emission Control Efficiency	No Control
	0

Tank Parameters	
Diameter, ft	Input
Shell Height or Length, ft	12.75
Nominal Capacity, gal	22.00
Shell Paint Color	21,011
Shell Paint Condition	Stainless Steel
Shell Insulated?	Average
Roof Paint Color	Yes
Roof Paint Condition	Stainless Steel
Roof Insulated?	Average
Temperature Controlled or Atmospheric?	Yes
Measured Liquid Bulk Temperature, F	Atmospheric
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	UF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	2,653,763
Vapor Molecular Weight, lb/mol	MV	Input	20.73
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	12.75
Effective Height, ft	HE	Equation 1-15	22.00
Maximum Liquid Height, ft	HLX	Equation 1-37	21.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	10.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0625
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.1328
Vapor Space Outage, ft	HVO	Equation 1-16	12.13
Vapor Space Volume, ft ³	VV	Equation 1-3	1548.98
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4306
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7831
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	354719.69
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2778.43
Annual Turnovers	N	Equation 1-36	138.92
Working Loss Turnover Factor	KN	Equation 1-35	0.38
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	220.3188
Total Losses, lb/yr	LT	Equation 1-1	220.32
Total Losses, tpy	LT	N/A	0.1102
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.6036
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0252

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Triethylamine	0.010%	1.05E-05	2.40E-06
Formaldehyde	7.54%	0.0093	0.0019
Methanol	10.95%	0.0121	0.0028
Methylene Glycol	0.59%	0.0007	0.0001
Hemiformal	0.18%	0.0002	0.0000
Total VOC	19.28%	0.0212	0.0048

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E82
FIN: U-10

Tank Properties	Input
Tank Identification	U-10
CIN	N/A
Tank Contents	UF Resin
Discharging to	Atmosphere
EPN	E82
Location for Calculation Purposes	Eugene, OR
Tank / Roof Type	Cone
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	12.75
Shell Height or Length, ft	22.00
Nominal Capacity, gal	21,011
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	UF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	2,653,763
Vapor Molecular Weight, lb/mol	MV	Input	20.73
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	12.75
Effective Height, ft	HE	Equation 1-15	22.00
Maximum Liquid Height, ft	HLX	Equation 1-37	21.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	10.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0625
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.1328
Vapor Space Outage, ft	HVO	Equation 1-16	12.13
Vapor Space Volume, ft ³	VV	Equation 1-3	1548.98
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4306
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7831
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	354719.69
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2778.43
Annual Turnovers	N	Equation 1-36	138.92
Working Loss Turnover Factor	KN	Equation 1-35	0.38
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	220.3188
Total Losses, lb/yr	LT	Equation 1-1	220.32
Total Losses, tpy	LT	N/A	0.1102
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.6036
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0252

Speciated Emissions	Vapor wt%	Uncontrolled	
		tpy	lb/hr
Triethylamine	0.010%	1.05E-05	2.40E-06
Formaldehyde	7.54%	0.0093	0.0019
Methanol	10.95%	0.0121	0.0028
Methylene Glycol	0.59%	0.0007	0.0001
Hemiformal	0.18%	0.0002	0.0000
Total VOC	19.28%	0.0212	0.0048

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E83
FIN: U-11

Tank Properties	
Tank Properties	Input
Tank Identification	U-11
CIN	N/A
Tank Contents	UF Resin
Discharging to	Atmosphere
EPN	E83
Location for Calculation Purposes	Eugene, OR
Tank / Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	9.27
Shell Height or Length, ft	17.00
Nominal Capacity, gal	8,574
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	UF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,082,988
Vapor Molecular Weight, lb/lbmol	MV	Input	20.73
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	9.27
Effective Height, ft	HE	Equation 1-15	17.00
Maximum Liquid Height, ft	HLX	Equation 1-37	16.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	7.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	9.50
Vapor Space Volume, ft ³	VV	Equation 1-3	640.54
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4306
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.8218
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	144759.42
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2146.97
Annual Turnovers	N	Equation 1-36	143.13
Working Loss Turnover Factor	KN	Equation 1-35	0.38
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	88.4185
Total Losses, lb/yr	LT	Equation 1-1	88.42
Total Losses, tpy	LT	N/A	0.0442
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.2422
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0101

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Triethylamine	0.010%	4.22E-06	9.64E-07
Formaldehyde	7.54%	0.0033	0.0009
Methanol	10.95%	0.0048	0.0011
Methylene Glycol	0.59%	0.0003	0.0001
Hemiformal	0.18%	0.0001	0.0000
Total VOC	19.28%	0.0085	0.0019

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E84
FIN: U-12

Tank Properties	
Tank Properties	Input
Tank Identification	U-12
CIN	N/A
Tank Contents	UF Resin
Discharging to	Atmosphere
EPN	E84
Location for Calculation Purposes	Eugene, OR
Tank / Roof Type	Cone
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	12.75
Shell Height or Length, ft	22.00
Nominal Capacity, gal	21,011
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	UF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	2,653,763
Vapor Molecular Weight, lb/bmol	MV	Input	20.73
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	12.75
Effective Height, ft	HE	Equation 1-15	22.00
Maximum Liquid Height, ft	HLX	Equation 1-37	21.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	10.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0625
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.1328
Vapor Space Outage, ft	HVO	Equation 1-16	12.13
Vapor Space Volume, ft ³	VV	Equation 1-3	1548.98
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4306
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7831
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	354719.69
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2778.43
Annual Turnovers	N	Equation 1-36	138.92
Working Loss Turnover Factor	KN	Equation 1-35	0.38
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	220.1188
Total Losses, lb/yr	LT	Equation 1-1	220.32
Total Losses, tpy	LT	N/A	0.1102
Avg. Daily Total Losses, lb/day	LAvg	Annualized Daily Average	0.6036
Avg. Hourly Total Losses, lb/hr	LAvg	Annualized Hourly Average	0.0252

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Triethylamine	0.010%	1.05E-05	2.40E-06
Formaldehyde	7.54%	0.0093	0.0019
Methanol	10.95%	0.0121	0.0028
Methylene Glycol	0.59%	0.0007	0.0001
Hemiformal	0.18%	0.0002	0.0000
Total VOC	19.28%	0.0212	0.0048

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E85
FIN: U-13

Tank Properties	
Tank Properties	Input
Tank Identification	U-13
CIN	N/A
Tank Contents	UF Resin
Discharging to	Atmosphere
EPN	E85
Location for Calculation Purposes	Eugene, OR
Tank / Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	12.74
Shell Height or Length, ft	21.00
Nominal Capacity, gal	26,010
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	UF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	2,527,394
Vapor Molecular Weight, lb/mol	MV	Input	20.73
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	12.74
Effective Height, ft	HE	Equation 1-15	21.00
Maximum Liquid Height, ft	HLX	Equation 1-37	20.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	11.50
Vapor Space Volume, ft ³	VV	Equation 1-3	1464.86
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4306
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.2921
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	337628.28
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2652.14
Annual Turnovers	N	Equation 1-36	139.59
Working Loss Turnover Factor	KN	Equation 1-35	0.38
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	209.2626
Total Losses, lb/yr	LT	Equation 1-1	209.26
Total Losses, tpy	LT	N/A	0.1046
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.5733
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0239

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Triethylamine	0.010%	9.99E-06	2.28E-06
Formaldehyde	7.54%	0.0079	0.0019
Methanol	10.95%	0.0115	0.0026
Methylene Glycol	0.59%	0.0006	0.0001
Hemiformal	0.18%	0.0002	0.0000
Total VOC	19.28%	0.0202	0.0046

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: 0
FIN: T-6

Tank Properties	
Tank Identification	Input
CIN	T-6
Tank Contents	N/A
Discharging to	UF Resin
EPN	Atmosphere
Location for Calculation Purposes	0
Tank / Roof Type	Eugene, OR
Underground?	Flat
Indoor?	Aboveground
Breather Vent Pressure Setting, psig	Outdoor
Breather Vent Vacuum Setting, psig	0.03
Pressure of Vapor Space at Normal Condition, psig	-0.03
Tank Vapor Balanced and Flashing Occurs?	0
Emission Control Method	No
Emission Control Efficiency	No Control
	0

Tank Parameters	Input
Diameter, ft	8.75
Shell Height or Length, ft	14.00
Nominal Capacity, gal	6,297
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	UF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	795,405
Vapor Molecular Weight, lb/mol	MV	Input	20.73
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	8.75
Effective Height, ft	HE	Equation 1-15	14.00
Maximum Liquid Height, ft	HLX	Equation 1-37	13.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	6.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	8.00
Vapor Space Volume, ft ³	VV	Equation 1-3	481.06
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4306
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.8456
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	106319.17
Sum of Increases in Liquid Level, ft	ΣHQIL	Equation 1-37	1768.09
Annual Turnovers	N	Equation 1-36	147.34
Working Loss Turnover Factor	KN	Equation 1-35	0.37
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	63.9058
Total Losses, lb/yr	LT	Equation 1-1	63.91
Total Losses, tpy	LT	N/A	0.0320
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.1751
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0073

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Triethylamine	0.010%	3.05E-06	6.97E-07
Formaldehyde	7.54%	0.0024	0.0006
Methanol	10.95%	0.0035	0.0008
Methylene Glycol	0.59%	0.0002	0.0000
Hemiformal	0.18%	0.0001	0.0000
Total VOC	19.28%	0.0062	0.0014

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E63
FIN: PR-1

Tank Properties	
Tank Identification	PR-1
CIN	N/A
Tank Contents	UF Resin
Discharging to	Atmosphere
EPN	E63
Location for Calculation Purposes	Eugene, OR
Tank / Roof Type	Cone
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	7.34
Shell Height or Length, ft	22.00
Nominal Capacity, gal	6,956
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	UF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	878,589
Vapor Molecular Weight, lb/lbmol	MV	Input	20.73
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	7.34
Effective Height, ft	HE	Equation 1-15	22.00
Maximum Liquid Height, ft	HLX	Equation 1-37	21.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	10.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0625
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.0764
Vapor Space Outage, ft	HVO	Equation 1-16	12.08
Vapor Space Volume, ft ³	VV	Equation 1-3	510.44
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4306
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7839
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	117438.00
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2778.43
Annual Turnovers	N	Equation 1-36	138.92
Working Loss Turnover Factor	KN	Equation 1-35	0.38
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	72,941.5
Total Losses, lb/yr	LT	Equation 1-1	72.94
Total Losses, tpy	LT	N/A	0.0365
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.1998
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0083

Speciated Emissions	Vapor wt%	Uncontrolled	
		tpy	lb/hr
Triethylamine	0.010%	3.48E-06	7.95E-07
Formaldehyde	7.54%	0.0027	0.0006
Methanol	10.95%	0.0040	0.0009
Methylene Glycol	0.59%	0.0002	0.0000
Hemiformal	0.18%	0.0001	0.0000
Total VOC	19.28%	0.0070	0.0016

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E64
FIN: PR-2

Tank Properties	
Tank Identification	PR-2
CIN	N/A
Tank Contents	UF Resin
Discharging to	Atmosphere
EPN	E64
Location for Calculation Purposes	Eugene, OR
Tank / Roof Type	Cone
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	7.34
Shell Height or Length, ft	22.00
Nominal Capacity, gal	6,956
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	UF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	878,589
Vapor Molecular Weight, lb/lbmol	MV	Input	20.73
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	7.34
Effective Height, ft	HE	Equation 1-15	22.00
Maximum Liquid Height, ft	HLX	Equation 1-37	21.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	10.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0625
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.0764
Vapor Space Outage, ft	HVO	Equation 1-16	12.08
Vapor Space Volume, ft ³	VV	Equation 1-3	510.44
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4306
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7839
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	117438.00
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2778.43
Annual Turnovers	N	Equation 1-36	138.92
Working Loss Turnover Factor	KN	Equation 1-35	0.38
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	72,941.5
Total Losses, lb/yr	LT	Equation 1-1	72.94
Total Losses, tpy	LT	N/A	0.0365
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.1998
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0083

Speciated Emissions	Vapor wt%	Uncontrolled	
		tpy	lb/hr
Triethylamine	0.010%	3.48E-06	7.95E-07
Formaldehyde	7.54%	0.0027	0.0006
Methanol	10.95%	0.0040	0.0009
Methylene Glycol	0.59%	0.0002	0.0000
Hemiformal	0.18%	0.0001	0.0000
Total VOC	19.28%	0.0070	0.0016

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E65
FIN: PR-3

Tank Properties	
Tank Identification	PR-3
CIN	N/A
Tank Contents	UF Resin
Discharging to	Atmosphere
EPN	E65
Location for Calculation Purposes	Eugene, OR
Tank / Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	8.04
Shell Height or Length, ft	22.00
Nominal Capacity, gal	8,355
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	UF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,055,227
Vapor Molecular Weight, lb/mol	MV	Input	20.73
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	8.04
Effective Height, ft	HE	Equation 1-15	22.00
Maximum Liquid Height, ft	HLX	Equation 1-37	21.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	10.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	12.00
Vapor Space Volume, ft ³	VV	Equation 1-3	609.19
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4306
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4306
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0016
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7850
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	141048.66
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2778.43
Annual Turnovers	N	Equation 1-36	138.92
Working Loss Turnover Factor	KN	Equation 1-35	0.38
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	87.6963
Total Losses, lb/yr	LT	Equation 1-1	87.61
Total Losses, tpy	LT	N/A	0.0438
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.2400
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0100

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Triethylamine	0.010%	4.18E-06	9.55E-07
Formaldehyde	7.54%	0.0023	0.0009
Methanol	10.95%	0.0048	0.0011
Methylene Glycol	0.59%	0.0003	0.0001
Hemiformal	0.18%	0.0001	0.0000
Total VOC	19.28%	0.0094	0.0019

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E72
FIN: T-1

Tank Properties	
Tank Properties	Input
Tank Identification	T-1
CIN	N/A
Tank Contents	MF Resin
Discharging to	Atmosphere
EPN	E72
Location for Calculation Purposes	Eugene, OR
Tank / Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Tank Parameters	Input
Diameter, ft	8.75
Shell Height or Length, ft	14.00
Nominal Capacity, gal	6,297
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Chilled
Measured Liquid Bulk Temperature, F	78.8
Measured Maximum Liquid Bulk Temperature, F	78.8
Measured Minimum Liquid Bulk Temperature, F	78.8
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	MF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,669,637
Vapor Molecular Weight, lb/mol	MV	Input	22.02
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	8.75
Effective Height, ft	HE	Equation 1-15	14.00
Maximum Liquid Height, ft	HLX	Equation 1-37	13.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	6.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	8.00
Vapor Space Volume, ft ³	VV	Equation 1-3	481.06
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1304
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	538.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	538.47
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	538.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	538.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	538.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.5528
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.5528
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.5528
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0021
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.8101
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	223174.82
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	3711.41
Annual Turnovers	N	Equation 1-36	309.28
Working Loss Turnover Factor	KN	Equation 1-35	0.26
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	123,972.9
Total Losses, lb/yr	LT	Equation 1-1	123.97
Total Losses, tpy	LT	N/A	0.0620
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.3397
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0142

Speciated Emissions	Vapor wt%	Uncontrolled	
		tpy	lb/hr
Diethylene Glycol	0.001%	6.23E-07	1.42E-07
Formaldehyde	0.000%	0.0000	0.0000
Methanol	28.10%	0.0174	0.0040
Methylene Glycol	0.00%	0.0000	0.0000
Hemiformal	0.13%	0.0001	0.0000
Total VOC	28.28%	0.0175	0.0040

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E73
FIN: T-2

Tank Properties	
Tank Properties	Input
Tank Identification	T-2
CIN	N/A
Tank Contents	MF Resin
Discharging to	Atmosphere
EPN	E73
Location for Calculation Purposes	Eugene, OR
Tank / Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Tank Parameters	Input
Diameter, ft	8.75
Shell Height or Length, ft	14.00
Nominal Capacity, gal	6,297
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	62.8
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	MF Resin
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,669,637
Vapor Molecular Weight, lb/mol	MV	Input	22.02
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	8.75
Effective Height, ft	HE	Equation 1-15	14.00
Maximum Liquid Height, ft	HLX	Equation 1-37	13.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	6.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	8.00
Vapor Space Volume, ft ³	VV	Equation 1-3	481.06
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1304
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.5528
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.5528
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.5528
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0022
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.8101
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	223174.82
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	3711.41
Annual Turnovers	N	Equation 1-36	309.28
Working Loss Turnover Factor	KN	Equation 1-35	0.26
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	11,1748
Working Loss, lb/yr	LW	Equation 1-35	127,7888
Total Losses, lb/yr	LT	Equation 1-1	138.94
Total Losses, tpy	LT	N/A	0.0695
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.3807
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0159

Uncontrolled			
Speciated Emissions	Vapor wt%	tpy	lb/hr
Diethylene Glycol	0.001%	6.98E-07	1.59E-07
Formaldehyde	0.00%	0.0000	0.0000
Methanol	28.10%	0.0195	0.0045
Methylene Glycol	0.00%	0.0000	0.0000
Hemiformal	0.13%	0.0001	0.0000
Total VOC	28.28%	0.0196	0.0045

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: Controlled by E43
FIN: PH-1

Tank Properties	
Tank Properties	Input
Tank Identification	PH-1
CIN	N/A
Tank Contents	Phenol
Discharging to	Scrubber
EPN	Controlled by E43
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	Scrubber
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	12.63
Shell Height or Length, ft	31.00
Nominal Capacity, gal	29,031
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, F	185
Measured Maximum Liquid Bulk Temperature, F	185
Measured Minimum Liquid Bulk Temperature, F	185
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Phenol
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	2,428,074
Vapor Molecular Weight, lb/lbmol	MV	Input	94.11
Vapor Pressure Coefficient A	A	Input	7.122
Vapor Pressure Coefficient B	B	Input	1509.7
Vapor Pressure Coefficient C	C	Input	174.2
Effective Diameter, ft	DE	Equation 1-14	12.63
Effective Height, ft	HE	Equation 1-15	31.00
Maximum Liquid Height, ft	HLX	Equation 1-37	30.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	14.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	16.50
Vapor Space Volume, ft ³	VV	Equation 1-3	2065.61
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	644.67
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1.17	644.67
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1.17	644.67
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	644.67
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	644.67
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.3836
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.3836
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.3836
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0052
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7488
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	324552.62
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2592.51
Annual Turnovers	N	Equation 1-36	89.40
Working Loss Turnover Factor	KN	Equation 1-35	0.50
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	850.7165
Total Losses, lb/yr	LT	Equation 1-1	850.7165
Total Losses, tpy		N/A	0.4254
Avg. Daily Total Losses, lb/day	LAvg	Annualized Daily Average	2.3307
Avg. Hourly Total Losses, lb/hr	LAvg	Annualized Hourly Average	0.0971
Controlled Emissions			
Total Annual Emissions, tpy		0.4254	
Avg. Daily Emissions, lb/day		2.3307	
Avg. Hourly Emissions, lb/hr		0.0971	

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: Controlled by E43
FIN: PH-2

Tank Properties	
Tank Properties	Input
Tank Identification	PH-2
CIN	N/A
Tank Contents	Phenol
Discharging to	Scrubber
EPN	Controlled by E43
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	Scrubber
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	12.63
Shell Height or Length, ft	31.00
Nominal Capacity, gal	29,031
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, F	185
Measured Maximum Liquid Bulk Temperature, F	185
Measured Minimum Liquid Bulk Temperature, F	185
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Phenol
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	2,428,074
Vapor Molecular Weight, lb/lbmol	MV	Input	94.11
Vapor Pressure Coefficient A	A	Input	7.122
Vapor Pressure Coefficient B	B	Input	1509.7
Vapor Pressure Coefficient C	C	Input	174.2
Effective Diameter, ft	DE	Equation 1-14	12.63
Effective Height, ft	HE	Equation 1-15	31.00
Maximum Liquid Height, ft	HLX	Equation 1-37	30.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	14.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	16.50
Vapor Space Volume, ft ³	VV	Equation 1-3	2065.61
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	644.67
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1.17	644.67
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1.17	644.67
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	644.67
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	644.67
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.3836
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.3836
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.3836
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0052
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7488
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	324552.62
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2592.51
Annual Turnovers	N	Equation 1-36	89.40
Working Loss Turnover Factor	KN	Equation 1-35	0.50
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	850.7165
Total Losses, lb/yr	LT	Equation 1-1	850.7165
Total Losses, tpy		N/A	0.4254
Avg. Daily Total Losses, lb/day	LAvg	Annualized Daily Average	2.3307
Avg. Hourly Total Losses, lb/hr	LAvg	Annualized Hourly Average	0.0971
Controlled Emissions			
Total Annual Emissions, tpy		0.4254	
Avg. Daily Emissions, lb/day		2.3307	
Avg. Hourly Emissions, lb/hr		0.0971	

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: 0
FIN: PH-3

Tank Properties	
Tank Properties	Input
Tank Identification	PH-3
CIN	N/A
Tank Contents	Phenol
Discharging to	Scrubber
EPN	0
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	Scrubber
Emission Control Efficiency	0

Tank Parameters	
Tank Parameters	Input
Diameter, ft	13.00
Shell Height or Length, ft	27.83
Nominal Capacity, gal	27,636
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, F	185
Measured Maximum Liquid Bulk Temperature, F	185
Measured Minimum Liquid Bulk Temperature, F	185
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Phenol
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	2,311,387
Vapor Molecular Weight, lb/lbmol	MV	Input	94.11
Vapor Pressure Coefficient A	A	Input	7.122
Vapor Pressure Coefficient B	B	Input	1509.7
Vapor Pressure Coefficient C	C	Input	174.2
Effective Diameter, ft	DE	Equation 1-14	13.00
Effective Height, ft	HE	Equation 1-15	27.83
Maximum Liquid Height, ft	HLX	Equation 1-37	26.83
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	12.92
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	14.92
Vapor Space Volume, ft ³	VV	Equation 1-3	1979.90
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	644.67
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1.17	644.67
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1.17	644.67
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	644.67
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	644.67
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.3836
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.3836
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.3836
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0052
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.7673
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	308955.35
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	2327.66
Annual Turnovers	N	Equation 1-36	90.10
Working Loss Turnover Factor	KN	Equation 1-35	0.50
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	805.5868
Total Losses, lb/yr	LT	Equation 1-1	805.5868
Total Losses, tpy	LT	N/A	0.4028
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	2.2071
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0920
Controlled Emissions			
Total Annual Emissions, tpy			0.4028
Avg. Daily Emissions, lb/day			2.2071
Avg. Hourly Emissions, lb/hr			0.0920

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E88
FIN: WW-1

Tank Properties	Input
Tank Identification	WW-1
ICH	N/A
Tank Contents	PE Washwater
Discharging to	Atmosphere
EPN	E88
Location for Calculation Purposes	Externa, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Insulated?	Outside
Breather Vent Pressure Setting, psia	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	10.00
Shell Height as Length, ft	12.50
Nominal Capacity, gal	12,632
Shell Paint Color	Brown
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	Brown
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required if the bulk liquid is heated periodically. Enter the frequency of

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1

Parameter	Symbol	Reference Equation	Assumed
Product Shipped		Input	PE Washwater
Type of Substance		Select One	Organic Liquid
Throughput, gal/second	Q	Input	1,002.863
Vapor Molecular Weight, lb/lbmol	MV	Input	18.09
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	10.00
Effective Height, ft	HE	Equation 1-15	21.50
Maximum Liquid Height, ft	HMX	Equation 1-17	20.95
Minimum Liquid Height, ft	HLN	Equation 1-17	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.15
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	RR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	11.95
Vapor Space Volume, ft ³	VV	Equation 1-3	522.84
Average Daily Maximum Ambient Temperature, R	TAM	Table 7-1-7	592.37
Average Daily Maximum Ambient Temperature, R	TAM	Table 7-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	26.10
Average Daily Total Solar Incident Heat, Btu/ft ² -day	T	Table 7-1-7	1294
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7-1-6	0.62
Tank Shell Solar Absorptance, dimensionless	aS	Table 7-1-6	0.62
Average Daily Vapor Temperature Range, R	ATV	Equation 1-27, 1-18, & 1	20.90
Average Daily Liquid Surface Temperature, R	LTA	Equation 1-27, 1-29, & 2	516.43
Average Daily Minimum Liquid Surface Temperature, R	LTM	Figure 7-1-17	509.18
Average Daily Maximum Liquid Surface Temperature, R	LTX	Figure 7-1-17	521.88
Liquid Bulk Temperature, R	TB	Equation 1-31, & 2	514.66
Average Vapor Temperature, R	TV	Equation 1-33, 1-34	513.20
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2256
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVM	Equation 1-25, 1-26	0.1721
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.2628
Vapor Density, lb/ft ³	DV	Equation 1-32	0.0007
Daily Vapor Pressure range, psi	DPV	Equation 1-9	0.105
Breather Vent Pressure Setting, psia	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Ambient Pressure, psia	PA	Table 7-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0522
Vertical Vapor Separation Factor	KS	Equation 1-11	0.8768
Net Working Loss Throughput, ft ³	VO	Equation 1-39	13671.23
Sum of Losses to Liquid Level, ft	ZSL	Equation 1-37	1725.95
Annual Turnovers	N	Equation 1-36	87.97
Working Loss Turnover Factor	KN	Equation 1-35	0.51
Working Loss Product Factor	PF	Equation 1-38	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	11.3156
Working Loss, lb/yr	LW	Equation 1-35	50.2503
Total Losses, lb/yr	LT	Equation 1-1	61.5209
Total Losses, tpy	LT	N/A	0.0029
Avg. Daily Total Losses, lb/day	LAVD	Annualized Daily Average	0.1686
Avg. Hourly Total Losses, lb/hr	LAVH	Annualized Hourly Average	0.0070

Regulated Emissions	Vapor wt%	
	lbw	lbv/hr
Formaldehyde, ft	0.00%	2.43E-02
Methanol	0.90%	0.0003
Pinene	0.00%	1.83E-02
Total VOC	0.90%	0.0003

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E91
FIN: WW-7

Tank Properties	Input
Tank Identification	WW-7
ICH	N/A
Tank Contents	PE Washwater
Discharging to	Atmosphere
EPN	E91
Location for Calculation Purposes	Externa, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Insulated?	Outside
Breather Vent Pressure Setting, psia	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	10.00
Shell Height as Length, ft	12.50
Nominal Capacity, gal	12,632
Shell Paint Color	Brown
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	Brown
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required if the bulk liquid is heated periodically. Enter the frequency of

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1

Parameter	Symbol	Reference Equation	Assumed
Product Shipped		Input	PE Washwater
Type of Substance		Select One	Organic Liquid
Throughput, gals/day	Q	Input	1,002,863
Vapor Molecular Weight, lb/lbmol	MV	Input	18.09
Vapor Pressure Coefficient A	A	Input	—
Vapor Pressure Coefficient B	B	Input	—
Vapor Pressure Coefficient C	C	Input	—
Effective Diameter, ft	DE	Equation 1-14	10.00
Effective Height, ft	HE	Equation 1-15	21.50
Maximum Liquid Height, ft	HMX	Equation 1-17	20.95
Minimum Liquid Height, ft	HLN	Equation 1-17	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.15
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	RR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	11.95
Vapor Space Volume, ft ³	VV	Equation 1-3	522.84
Average Daily Maximum Ambient Temperature, R	TAM	Table 7-1.7	592.37
Average Daily Maximum Ambient Temperature, R	TAM	Table 7-1.7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	26.10
Average Daily Total Solar Irradiation Factor, Btu/ft ² -day	I	Table 7-1.7	1294
Average Daily Ambient Temperature, R	TAA	Equation 1-36	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7-1.6	0.62
Tank Shell Solar Absorptance, dimensionless	aS	Table 7-1.6	0.62
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-8, 8-1	20.90
Average Daily Liquid Surface Temperature, R	LTA	Equation 1-27, 1-29, 8-2	516.43
Average Daily Minimum Liquid Surface Temperature, R	LTL	Figure 7-1.17	509.18
Average Daily Maximum Liquid Surface Temperature, R	LTX	Figure 7-1.17	521.88
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	514.66
Average Vapor Temperature, R	TV	Equation 1-33, 1-34	513.20
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2256
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVM	Equation 1-25, 1-26	0.1721
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVM	Equation 1-25, 1-26	0.2628
Vapor Density, lb/ft ³	VDV	Equation 1-32	0.0007
Daily Vapor Pressure range, psi	DPV	Equation 1-9	0.105
Breather Vent Pressure Setting, psia	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	BRP	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7-1.7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0522
Vertical Vapor Separation Factor	KS	Equation 1-11	0.8768
Net Working Loss Throughput, ft ³	VO	Equation 1-39	13671.23
Sum of Losses in Liquid Level, ft	ZLZL	Equation 1-37	1725.95
Annual Turnovers	N	Equation 1-36	87.97
Working Loss Turnover Factor	KN	Equation 1-35	0.51
Working Loss Product Factor	WF	Equation 1-38	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	11.3156
Working Loss, lb/yr	LW	Equation 1-35	58.2503
Total Losses, lb/yr	LT	Equation 1-1	61.5209
Total Losses, tpy	LT	N/A	0.0029
Avg. Daily Total Losses, lb/day	LAVD	Annualized Daily Average	0.1686
Avg. Hourly Total Losses, lb/hr	LAVH	Annualized Hourly Average	0.0070

Regulated Emissions	Vapor wt%		
	WV	lb/yr	Uncontrolled
Formaldehyde, ft	0.00%	2.43E-02	5.55E-08
Methanol	0.90%	0.0003	0.0001
Pinene	0.00%	1.43E-02	8.75E-08
Total VOC	0.90%	0.0003	0.0001

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E92
FIN: WW-8

Tank Properties	
Tank Identification	WW-8
ICH	N/A
Tank Contents	PE Washwater
Discharging to	Atmosphere
EPN	E92
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Insulated?	Outside
Breather Vent Pressure Setting, psia	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	10.00
Shell Height as Length, ft	12.50
Nominal Capacity, gal	12,632
Shell Paint Color	Brown
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	Brown
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required if the bulk liquid is heated periodically. Enter the frequency of

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1

Parameter	Symbol	Reference Equation	Assumed
Product Shipped		Input	PE Washwater
Type of Substance		Select One	Organic Liquid
Throughput, gals/day	Q	Input	1,002,863
Vapor Molecular Weight, lb/lbmol	MV	Input	18.09
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	10.00
Effective Height, ft	HE	Equation 1-15	21.50
Maximum Liquid Height, ft	HMX	Equation 1-17	20.95
Minimum Liquid Height, ft	HLN	Equation 1-17	1.00
Average Liquid Height, ft	HL	Equation 1-18	9.15
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Cone Tank Roof Radius, ft	RR	Equation 1-20	N/A
Cone Tank Roof Height, ft	RR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	11.95
Vapor Space Volume, ft ³	VV	Equation 1-3	522.84
Average Daily Maximum Ambient Temperature, R	TAM	Table 7-1-7	592.37
Average Daily Maximum Ambient Temperature, R	TAM	Table 7-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	26.10
Average Daily Total Solar Irradiation Factor, Btu/ft ² -day	T	Table 7-1-7	1294
Average Daily Ambient Temperature, R	TAA	Equation 1-36	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7-1-6	0.62
Tank Shell Solar Absorptance, dimensionless	aS	Table 7-1-6	0.62
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-8, & 1	20.90
Average Daily Liquid Surface Temperature, R	LTA	Equation 1-27, 1-28, & 2	516.43
Average Daily Minimum Liquid Surface Temperature, R	LTM	Figure 7-1-17	509.18
Average Daily Maximum Liquid Surface Temperature, R	LTX	Figure 7-1-17	521.88
Liquid Bulk Temperature, R	TB	Equation 1-31, & 2	514.66
Average Vapor Temperature, R	TV	Equation 1-33, 1-34	513.20
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2256
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVM	Equation 1-25, 1-26	0.1721
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.2628
Vapor Density, lb/ft ³	DV	Equation 1-32	0.0007
Daily Vapor Pressure range, psi	DPV	Equation 1-9	0.105
Breather Vent Pressure Setting, psia	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	BRP	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0522
Vertical Vapor Separation Factor	KS	Equation 1-11	0.8768
Net Working Loss Throughput, ft ³	VO	Equation 1-39	13671.23
Sum of Losses in Liquid Level, ft	ZLZL	Equation 1-37	1725.95
Annual Turnovers	N	Equation 1-36	87.97
Working Loss Turnover Factor	KN	Equation 1-35	0.51
Working Loss Product Factor	WF	Equation 1-38	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00

Uncontrolled Emissions

Standing Storage Loss, lb/yr	LS	Equation 1-2	11.3156
Working Loss, lb/yr	LW	Equation 1-35	50.2503
Total Losses, lb/yr	LT	Equation 1-1	61.5709
Total Losses, tpy	LT	N/A	0.0029
Avg. Daily Total Losses, lb/day	LAVD	Annualized Daily Average	0.1686
Avg. Hourly Total Losses, lb/hr	LAVH	Annualized Hourly Average	0.0070

Regulated Emissions		Vapor wt%		Uncontrolled	
				lb/yr	lb/hr
Formaldehyde, lb	0.00%			2.43E-02	5.55E-03
Methanol	0.90%			0.0003	0.0001
Pinene	0.00%			1.43E-02	3.35E-03
Total VOC	0.90%			0.0003	0.0001

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E93
FIN: WWW-1

Tank Properties	
Tank Identification	WWW-1
ICH	
Tank Contents	PE Washwater
Discharging to	Atmosphere
EPN	E93
Location for Calculation Purposes	Externa, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Insulated?	Insider
Breather Vent Pressure Setting, psia	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	5.00
Shell Height as Length, ft	15.00
Nominal Capacity, gal	5,640
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	63.8
Measured Minimum Liquid Bulk Temperature, F	62.7
Maximum Number of Heating Cycles per Year	365

Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required if the bulk liquid is heated periodically. Enter the frequency of

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1

Parameter	Symbol	Reference Equation	Assumed
Product Shipped		Input	PE Washwater
Type of Substance		Select One	Organic Liquid
Throughput, gals/day	Q	Input	450.088
Vapor Molecular Weight, lb/lbmol	MV	Input	18.09
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	8.00
Effective Height, ft	HE	Equation 1-15	15.00
Maximum Liquid Height, ft	HMX	Equation 1-17	10.00
Minimum Liquid Height, ft	HLN	Equation 1-17	1.00
Average Liquid Height, ft	HL	Equation 1-16	6.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	RR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	8.50
Vapor Space Volume, ft ³	VV	Equation 1-3	427.26
Average Daily Maximum Ambient Temperature, R	TAM	Table 7-1.7	592.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7-1.7	529.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	26.10
Average Daily Total Solar Radiation Factor, Btu/ft ² -day	T	Table 7-1.7	1294
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7-1.6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 7-1.6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-27, 1-18, B-1	28.10
Average Daily Liquid Surface Temperature, R	LTA	Equation 1-27, 1-29, B-2	529.47
Average Daily Minimum Liquid Surface Temperature, R	LTL	Figure 7-1.17	500.27
Average Daily Maximum Liquid Surface Temperature, R	LTX	Figure 7-1.17	529.47
Liquid Bulk Temperature, R	TB	Equation 1-31, B-2	529.47
Average Vapor Temperature, R	TV	Equation 1-33, 1-34	529.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2805
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVL	Equation 1-25, 1-26	0.1327
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.2805
Vapor Density, lb/ft ³	VDV	Equation 1-32	0.0009
Daily Vapor Pressure range, psi	DPV	Equation 1-9	0.1478
Breather Vent Pressure Setting, psia	PBV	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	BRP	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7-1.7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vertical Vapor Separation Factor	KS	Equation 1-11	0.8878
Net Working Loss Throughput, ft ³	VO	Equation 1-39	80199.11
Sum of Increases in Liquid Level, ft	ZINCL	Equation 1-37	1106.00
Annual Turnovers	N	Equation 1-36	92.06
Working Loss Turnover Factor	KN	Equation 1-35	0.49
Working Loss Product Factor	KF	Equation 1-38	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	4.5331
Working Loss, lb/yr	LW	Equation 1-35	26.5124
Total Losses, lb/yr	LT	Equation 1-1	31.0455
Total Losses, tpy	LT	N/A	0.0157
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.0899
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0036

Regulated Emissions		Vapor wt%		Uncontrolled	
Formaldehyde, lb	0.00%			1.38E-02	2.95E-08
Methanol	0.87%		0.0001	0.0000	
Pinene	0.00%			2.17E-07	4.96E-08
Total VOC	0.87%		0.0001	0.0000	

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E94
FIN: WWW-2

Tank Properties	
Tank Identification	WWW-2
ICH	
Tank Contents	PE Washwater
Discharging to	Atmosphere
EPN	E94
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Isolated?	Isolated
Breather Vent Pressure Setting, psia	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	10.67
Shell Height as Length, ft	12.00
Nominal Capacity, gal	9,022
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	63.8
Measured Minimum Liquid Bulk Temperature, F	62.7
Maximum Number of Heating Cycles per Year	365

Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required if the bulk liquid is heated periodically. Enter the frequency of

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1

Parameter	Symbol	Reference Equation	Assumed
Product Shipped		Input	PE Washwater
Type of Substance		Select One	Organic Liquid
Throughput, gal/second	Q	Input	660.087
Vapor Molecular Weight, lb/lbmol	MV	Input	18.09
Vapor Pressure Coefficient A	A	Input	-
Vapor Pressure Coefficient B	B	Input	-
Vapor Pressure Coefficient C	C	Input	-
Effective Diameter, ft	DE	Equation 1-14	10.67
Effective Height, ft	HE	Equation 1-15	12.00
Maximum Liquid Height, ft	HMX	Equation 1-17	11.00
Minimum Liquid Height, ft	HLN	Equation 1-17	1.00
Average Liquid Height, ft	HL	Equation 1-16	5.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	RR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 + 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	-7.00
Vapor Space Volume, ft ³	VV	Equation 1-3	625.53
Average Daily Maximum Ambient Temperature, R	TAM	Table 7-1-7	928.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7-1-7	529.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	26.10
Average Daily Total Solar Radiation Factor, Btu/ft ² -day	T	Table 7-1-7	1294
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7-1-5	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 7-1-5	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-27, 1-18, & 1	20.10
Average Daily Liquid Surface Temperature, R	LTA	Equation 1-27, 1-29, & 2	529.47
Average Daily Minimum Liquid Surface Temperature, R	LTL	Figure 7-1-17	500.37
Average Daily Maximum Liquid Surface Temperature, R	LTX	Figure 7-1-17	525.47
Liquid Bulk Temperature, R	TB	Equation 1-31, & 2	524.47
Average Vapor Temperature, R	TV	Equation 1-33, 1-34	523.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2805
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVL	Equation 1-25, 1-26	0.1327
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.2805
Vapor Density, lb/ft ³	DV	Equation 1-32	0.0009
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.1478
Breather Vent Pressure Setting, psia	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vertical Vapor Separation Factor	KS	Equation 1-31	0.9527
Net Working Loss Throughput, ft ³	VO	Equation 1-39	85591.62
Sum of Losses to Liquid Level, ft	ZLZL	Equation 1-37	977.56
Annual Turnovers	N	Equation 1-36	95.75
Working Loss Turnover Factor	KN	Equation 1-35	0.48
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00

Uncontrolled Emissions

Standing Storage Loss, lb/yr	LS	Equation 1-2	6.7707
Working Loss, lb/yr	LW	Equation 1-35	37.3643
Total Losses, lb/yr	LT	Equation 1-1	44.1350
Total Losses, tpy	LT	N/A	0.6220
Avg. Daily Total Losses, lb/day	LAVD	Annualized Daily Average	0.1205
Avg. Hourly Total Losses, lb/hr	LAVH	Annualized Hourly Average	0.0050

Regulated Emissions		Vapor wt%		Uncontrolled	
Formaldehyde, lb		0.00%		1.65E-02	4.18E-08
Methanol		0.87%		0.0002	0.0000
Pinene		0.00%		1.05E-02	6.95E-08
Total VOC		0.87%		0.0002	0.0000

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E68
FIN: ST-3

Tank Properties	Input
Tank Identification	ST-3
ICH	N/A
Tank Contents	PE Seawater
Discharging to	ESB
EPN	E68
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Insulated?	Outside
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	Rubber
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	9.50
Shell Height as Length, ft	16.00
Nominal Capacity, gal	9,544
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Chilled
Measured Liquid Bulk Temperature, °F	51.8
Measured Maximum Liquid Bulk Temperature, °F	51.8
Measured Minimum Liquid Bulk Temperature, °F	51.8
Maximum Number of Heating Cycles per Year	365

Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required if the bulk liquid is heated periodically. Enter the frequency of

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1

Parameter	Symbol	Reference Equation	Assumed
Product Shipped		Input	PE Seawater
Type of Substance		Select One	Organic Liquid
Throughput, gal/annhr	Q	Input	751.680
Vapor Molecular Weight, lb/lbmol	MV	Input	18.08
Vapor Pressure Coefficient A	A	Input	—
Vapor Pressure Coefficient B	B	Input	—
Vapor Pressure Coefficient C	C	Input	—
Effective Diameter, ft	DE	Equation 1-14	9.50
Effective Height, ft	HE	Equation 1-15	16.00
Maximum Liquid Height, ft	HMX	Equation 1-17	17.00
Minimum Liquid Height, ft	HLN	Equation 1-17	1.00
Average Liquid Height, ft	HL	Equation 1-16	8.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	RR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 + 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	16.00
Vapor Space Volume, ft ³	VV	Equation 1-3	708.82
Average Daily Maximum Ambient Temperature, °R	TAM	Table 7-1.7	928.77
Average Daily Maximum Ambient Temperature, °R	TAM	Table 7-1.7	522.47
Average Daily Ambient Temperature Range, °R	ATA	Equation 1-11	26.10
Average Daily Total Solar Irradiation Factor, Btu/ft ² -day	I	Table 7-1.7	1204
Average Daily Ambient Temperature, °R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7-1.6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 7-1.6	N/A
Average Daily Vapor Temperature Range, °R	ATV	Equation 1-27, 1-18, & 1	0.00
Average Daily Liquid Surface Temperature, °R	LTA	Equation 1-27, 1-29, & 2	511.47
Average Daily Minimum Liquid Surface Temperature, °R	LTL	Figure 7-1.17	511.47
Average Daily Maximum Liquid Surface Temperature, °R	LTX	Figure 7-1.17	511.47
Liquid Bulk Temperature, °R	TB	Equation 1-31, & 2	511.47
Average Vapor Temperature, °R	TV	Equation 1-33, 1-34	511.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.1875
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVL	Equation 1-25, 1-26	0.1875
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.1875
Vapor Density, lb/ft ³	VDV	Equation 1-32	0.0006
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7-1.7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vertical Vapor Separation Factor	KS	Equation 1-11	0.9096
Net Working Loss Throughput, ft ³	VO	Equation 1-39	10980.49
Sum of Losses to Liquid Level, ft	ZLZL	Equation 1-37	1426.70
Annual Turnovers	N	Equation 1-36	89.76
Working Loss Turnover Factor	KN	Equation 1-35	0.50
Working Loss Product Factor	WF	Equation 1-38	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00

Uncontrolled Emissions

Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	31.882
Total Losses, lb/yr	LT	Equation 1-1	31.882
Total Losses, tpy	LT	N/A	0.0157
Avg. Daily Total Losses, lb/day	LAVD	Annualized Daily Average	0.0863
Avg. Hourly Total Losses, lb/hr	LAVH	Annualized Hourly Average	0.0036

Regulated Emissions	Vapor wt%	Uncontrolled	
		lbw	lbw/hr
Formaldehyde, lb	0.61%	0.178 (2)	1.95 (2)
Methanol	0.77%	0.0021	0.0000
Pinene	0.00%	4.54E-08	1.04E-08
Total VOC	0.74%	0.0001	0.0000

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E69
FIN: ST-4

Tank Properties	Input
Tank Identification	ST-4
ICH	N/A
Tank Contents	UF Seawater
Discharging to	Scrubber
EPN	E69
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Insulated?	Outside
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	Scrubber
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	9.50
Shell Height as Length, ft	N/A
Nominal Capacity, gal	9,544
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Chilled
Measured Liquid Bulk Temperature, °F	51.8
Measured Maximum Liquid Bulk Temperature, °F	51.8
Measured Minimum Liquid Bulk Temperature, °F	51.8
Maximum Number of Heating Cycles per Year	365

Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required if the bulk liquid is heated periodically. Enter the frequency of

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1

Parameter	Symbol	Reference Equation	Annual
Product Shipped		Input	116 Seawater
Type of Substance		Select One	Organic Liquid
Throughput, gals/day	Q	Input	4,465,923
Vapor Molecular Weight, lb/lbmol	MV	Input	18.30
Vapor Pressure Coefficient A	A	Input	—
Vapor Pressure Coefficient B	B	Input	—
Vapor Pressure Coefficient C	C	Input	—
Effective Diameter, ft	DE	Equation 1-14	9.50
Effective Height, ft	HE	Equation 1-15	10.00
Maximum Liquid Height, ft	HMX	Equation 1-17	17.00
Minimum Liquid Height, ft	HLN	Equation 1-17	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	RR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	10.00
Vapor Space Volume, ft ³	VV	Equation 1-3	708.82
Average Daily Maximum Ambient Temperature, °R	TAM	Table 7-1.7	903.77
Average Daily Maximum Ambient Temperature, °R	TAM	Table 7-1.7	522.47
Average Daily Ambient Temperature Range, °R	ATA	Equation 1-11	20.10
Average Daily Total Solar Irradiation Factor, Btu/ft ² -day	I	Table 7-1.7	1204
Average Daily Ambient Temperature, °R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7-1.6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 7-1.6	N/A
Average Daily Vapor Temperature Range, °R	ATV	Equation 1-27, 1-18, & 1	0.00
Average Daily Liquid Surface Temperature, °R	LTA	Equation 1-27, 1-29, & 2	511.47
Average Daily Minimum Liquid Surface Temperature, °R	LTA	Figure 7-1.17	511.47
Average Daily Maximum Liquid Surface Temperature, °R	LTA	Figure 7-1.17	511.47
Liquid Bulk Temperature, °R	TB	Equation 1-31, & 2	511.47
Average Vapor Temperature, °R	TV	Equation 1-33, 1-34	511.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.1888
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVM	Equation 1-25, 1-26	0.1888
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVM	Equation 1-25, 1-26	0.1888
Vapor Density, lb/ft ³	VDV	Equation 1-32	0.0006
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7-1.7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vertical Vapor Separation Factor	KS	Equation 1-11	0.9901
Net Working Loss Throughput, ft ³	VO	Equation 1-39	59681.40
Sum of Losses in Liquid Level, ft	ZLZL	Equation 1-37	9103.77
Annual Turnovers	N	Equation 1-36	526.24
Working Loss Turnover Factor	KN	Equation 1-35	0.22
Working Loss Product Factor	WF	Equation 1-38	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	88.0005
Total Losses, lb/yr	LT	Equation 1-1	88.0005
Total Losses, tpy	LT	N/A	0.0420
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.233
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0096

Regulated Emissions		Vapor wt%		Uncontrolled	
Formaldehyde, lb	0.00%			1.37E-05	3.08E-05
Methanol	3.41%			0.0014	0.0003
Pinene	0.00%			1.29E-07	2.73E-08
Total VOC	3.46%			0.0014	0.0003

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E124
FIN: R2-4

Tank Properties	Input
Tank Identification	R2-4
ICH	N/A
Tank Contents	PE Distillate
Discharging to	Atmosphere
EPN	E124
Location for Calculation Purposes	Exposure, OR
Tank/Roof Type	Dome
Underground?	Aboveground
Insulated?	Insider
Breather Vent Pressure Setting, psia	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	6.00
Shell Height or Length, ft	N/A
Nominal Capacity, gal	1,034
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	63.8
Measured Minimum Liquid Bulk Temperature, F	62.7
Maximum Number of Heating Cycles per Year	365

Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required if the bulk liquid is heated periodically. Enter the frequency of

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1

Parameter	Symbol	Reference Equation	Assumed
Product Shipped		Input	PE Distillate
Type of Substance		Select One	Organic Liquid
Throughput, gal/yr	Q	Input	761,598
Vapor Molecular Weight, lb/lbmol	MV	Input	18.07
Vapor Pressure Coefficient A	A	Input	—
Vapor Pressure Coefficient B	B	Input	—
Vapor Pressure Coefficient C	C	Input	—
Effective Diameter, ft	DE	Equation 1-14	6.00
Effective Height, ft	HE	Equation 1-15	11.00
Maximum Liquid Height, ft	HMX	Equation 1-17	10.00
Minimum Liquid Height, ft	HLN	Equation 1-17	1.00
Average Liquid Height, ft	HL	Equation 1-16	4.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0625
Dome Tank Roof Radius, ft	RR	Equation 1-20	4.00
Dome Tank Roof Height, ft	HR	Equation 1-20	0.538
Roof Outage, ft	HRO	Equation 1-17 + 1-19	0.5298
Vapor Space Outage, ft	HVO	Equation 1-16	9.77
Vapor Space Volume, ft ³	VV	Equation 1-3	86.13
Average Daily Maximum Ambient Temperature, R	TAM	Table 7-1.7	928.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7-1.7	529.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	26.10
Average Daily Total Solar Incident Heat, Btu/ft ² -day	I	Table 7-1.7	1294
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7-1.6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 7-1.6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-27, 1-18, & 1	20.10
Average Daily Liquid Surface Temperature, R	LTA	Equation 1-27, 1-29, & 2	529.47
Average Daily Minimum Liquid Surface Temperature, R	LTL	Figure 7-1.17	500.37
Average Daily Maximum Liquid Surface Temperature, R	LTX	Figure 7-1.17	525.47
Liquid Bulk Temperature, R	TB	Equation 1-31, & 2	524.47
Average Vapor Temperature, R	TV	Equation 1-33, 1-34	523.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2557
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVL	Equation 1-25, 1-26	0.1208
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.2627
Vapor Density, lb/ft ³	VDV	Equation 1-32	0.0008
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.1349
Breather Vent Pressure Setting, psia	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7-1.7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0162
Vertical Vapor Separation Factor	KS	Equation 1-31	0.9189
Net Working Loss Throughput, ft ³	VO	Equation 1-39	9596.38
Sum of Increases in Liquid Level, ft	ΣΔSL	Equation 1-37	780.52
Annual Turnovers	N	Equation 1-36	876.84
Working Loss Turnover Factor	KN	Equation 1-35	0.20
Working Loss Product Factor	WF	Equation 1-38	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.8886
Working Loss, lb/yr	LW	Equation 1-35	18.515
Total Losses, lb/yr	LT	Equation 1-1	17.2663
Total Losses, tpy	LT	N/A	0.0096
Avg. Daily Total Losses, lb/day	LAVD	Annualized Daily Average	0.0007
Avg. Hourly Total Losses, lb/hr	LAVH	Annualized Hourly Average	0.0009

Regulated Emissions	Vapor wt%		Uncontrolled	
	lb/lb	lb/yr	lb/yr	lb/yr
Formaldehyde	0.1%	3.85E-05	0.1%	0.75E-05
Total VOC	0.71%	0.0009	0.0009	0.0000

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E125
FIN: R2-5

Tank Properties	Input
Tank Identification	R2-5
ICH	N/A
Tank Contents	PE Distillate
Discharging to	Atmosphere
EPN	E125
Location for Calculation Purposes	Exposure, OR
Tank/Roof Type	Dome
Underground?	Aboveground
Isolated?	Isolated
Breather Vent Pressure Setting, psia	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	6.00
Shell Height or Length, ft	N/A
Nominal Capacity, gal	1,034
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, °F	62.8
Measured Maximum Liquid Bulk Temperature, °F	63.8
Measured Minimum Liquid Bulk Temperature, °F	62.7
Maximum Number of Heating Cycles per Year	365

Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required if the bulk liquid is heated periodically. Enter the frequency of

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1

Parameter	Symbol	Reference Equation	Assumed
Product Shipped		Input	PE Distillate
Type of Substance		Select One	Organic Liquid
Throughput, gal/yr	Q	Input	761,598
Vapor Molecular Weight, lb/lbmol	MV	Input	18.07
Vapor Pressure Coefficient A	A	Input	-
Vapor Pressure Coefficient B	B	Input	-
Vapor Pressure Coefficient C	C	Input	-
Effective Diameter, ft	DE	Equation 1-14	6.00
Effective Height, ft	HE	Equation 1-15	11.00
Maximum Liquid Height, ft	HMX	Equation 1-17	10.00
Minimum Liquid Height, ft	HLN	Equation 1-17	1.00
Average Liquid Height, ft	HL	Equation 1-16	4.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0625
Dome Tank Roof Radius, ft	RR	Equation 1-20	4.00
Dome Tank Roof Height, ft	RR	Equation 1-20	0.538
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.429
Vapor Space Outage, ft	HVO	Equation 1-16	9.77
Vapor Space Volume, ft ³	VV	Equation 1-3	86.13
Average Daily Maximum Ambient Temperature, °R	TAM	Table 7-1.7	923.77
Average Daily Maximum Ambient Temperature, °R	TAM	Table 7-1.7	529.47
Average Daily Ambient Temperature Range, °R	ΔTA	Equation 1-11	26.10
Average Daily Total Solar Incident Heat, Btu/ft ² -day	I	Table 7-1.7	1294
Average Daily Ambient Temperature, °R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7-1.6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7-1.6	N/A
Average Daily Vapor Temperature Range, °R	ΔTV	Equation 1-27, 1-18, & 1	20.10
Average Daily Liquid Surface Temperature, °R	TLA	Equation 1-27, 1-29, & 2	529.47
Average Daily Minimum Liquid Surface Temperature, °R	TLN	Figure 7-1.17	500.37
Average Daily Maximum Liquid Surface Temperature, °R	TLX	Figure 7-1.17	525.47
Liquid Bulk Temperature, °R	TB	Equation 1-31, & 2	524.47
Average Vapor Temperature, °R	TV	Equation 1-33, 1-34	523.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2557
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.1208
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.2627
Vapor Density, lb/ft ³	ρV	Equation 1-32	0.0008
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.1349
Breather Vent Pressure Setting, psia	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7-1.7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0162
Vertical Vapor Separation Factor	KS	Equation 1-11	0.9193
Net Working Loss Throughput, ft ³	VO	Equation 1-39	9596.38
Sum of Increases in Liquid Level, ft	ΣΔSL	Equation 1-37	780.52
Annual Turnovers	N	Equation 1-36	876.84
Working Loss Turnover Factor	KN	Equation 1-35	0.20
Working Loss Product Factor	WF	Equation 1-38	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.8886
Working Loss, lb/yr	LW	Equation 1-35	18.515
Total Losses, lb/yr	LT	Equation 1-1	17.2663
Total Losses, tpy	LT	N/A	0.0096
Avg. Daily Total Losses, lb/day	LAVD	Annualized Daily Average	0.0473
Avg. Hourly Total Losses, lb/hr	LAVH	Annualized Hourly Average	0.0039

Regulated Emissions	Vapor wt%		Uncontrolled	
	lb/lb	lb/yr	lb/lb	lb/yr
Formaldehyde	0.1%	3.85E-05	0.1%	8.75E-05
Total VOC	0.71%	0.0009	0.0009	0.0009

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E128
FIN: R2-8

Tank Properties	Input
Tank Identification	R2-8
ICH	N/A
Tank Contents	PE Distillate
Discharging to	Atmosphere
EPN	E128
Location for Calculation Purposes	Exposure, OR
Tank/Roof Type	Dome
Underground?	Aboveground
Insulated?	Insider
Breather Vent Pressure Setting, psia	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	3.00
Shell Height or Length, ft	7.00
Nominal Capacity, gal	370
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, °F	62.8
Measured Maximum Liquid Bulk Temperature, °F	63.8
Measured Minimum Liquid Bulk Temperature, °F	62.7
Maximum Number of Heating Cycles per Year	365

Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required if the bulk liquid is heated periodically. Enter the frequency of

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1

Parameter	Symbol	Reference Equation	Assumed
Product Shipped		Input	PE Distillate
Type of Substance		Select One	Organic Liquid
Throughput, gal/annum	Q	Input	263,589
Vapor Molecular Weight, lb/lbmol	MV	Input	18.07
Vapor Pressure Coefficient A	A	Input	—
Vapor Pressure Coefficient B	B	Input	—
Vapor Pressure Coefficient C	C	Input	—
Effective Diameter, ft	DE	Equation 1-14	3.00
Effective Height, ft	HE	Equation 1-15	7.00
Maximum Liquid Height, ft	HMX	Equation 1-17	6.00
Minimum Liquid Height, ft	HLN	Equation 1-17	1.00
Average Liquid Height, ft	HL	Equation 1-16	2.50
Conic Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0926
Dome Tank Roof Radius, ft	RR	Equation 1-20	3.00
Dome Tank Roof Height, ft	RR	Equation 1-20	0.402
Roof Outage, ft	HRO	Equation 1-17 + 1-19	0.0008
Vapor Space Outage, ft	HVO	Equation 1-16	-0.1
Vapor Space Volume, ft ³	VV	Equation 1-3	33.26
Average Daily Maximum Ambient Temperature, °R	TAM	Table 7-1-7	922.37
Average Daily Maximum Ambient Temperature, °R	TAX	Table 7-1-7	522.47
Average Daily Ambient Temperature Range, °R	ATA	Equation 1-11	26.10
Average Daily Total Solar Irradiation Factor, Btu/ft ² -day	I	Table 7-1-7	1294
Average Daily Ambient Temperature, °R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 7-1-6	N/A
Average Daily Vapor Temperature Range, °R	ATV	Equation 1-27, 1-18, & 1	20.10
Average Daily Liquid Surface Temperature, °R	LTA	Equation 1-27, 1-29, & 2	522.47
Average Daily Minimum Liquid Surface Temperature, °R	LTA	Figure 7-1-17	502.37
Average Daily Maximum Liquid Surface Temperature, °R	LTA	Figure 7-1-17	522.47
Liquid Bulk Temperature, °R	TB	Equation 1-31, & 2	522.47
Average Vapor Temperature, °R	TV	Equation 1-33, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2557
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVM	Equation 1-25, 1-26	0.1208
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVM	Equation 1-25, 1-26	0.2627
Vapor Density, lb/ft ³	VDV	Equation 1-32	0.0008
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.1349
Breather Vent Pressure Setting, psia	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vertical Vapor Separation Factor	KS	Equation 1-11	0.9903
Net Working Loss Throughput, ft ³	VO	Equation 1-39	26497.22
Sum of Losses in Liquid Level, ft	ZLZL	Equation 1-37	903.51
Annual Turnovers	N	Equation 1-36	3004.38
Working Loss Turnover Factor	KN	Equation 1-35	0.20
Working Loss Product Factor	WF	Equation 1-38	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.2403
Working Loss, lb/yr	LW	Equation 1-35	5.2707
Total Losses, lb/yr	LT	Equation 1-1	6.0000
Total Losses, tpy	LT	N/A	0.0030
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.0007
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0007

Regulated Emissions	Vapor wt%		Uncontrolled	
	lb/yr	lb/yr	lb/yr	lb/yr
Formaldehyde	0.1%	1.38E-05	1.38E-05	1.38E-05
Total VOC	0.71%	0.0009	0.0009	0.0009

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E126
FIN: R2-6

Tank Properties	Input
Tank Identification	R2-6
ICH	N/A
Tank Contents	UF Distillate
Discharging to	Atmosphere
EPN	E126
Location for Calculation Purposes	Exposure, OR
Tank/Roof Type	Dome
Underground?	Aboveground
Insulated?	Insider
Breather Vent Pressure Setting, psia	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	7.00
Shell Height as Length, ft	N/A
Nominal Capacity, gal	2,879
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	63.8
Measured Minimum Liquid Bulk Temperature, F	62.7
Maximum Number of Heating Cycles per Year	365

Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required if the bulk liquid is heated periodically. Enter the frequency of

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1

Parameter	Symbol	Reference Equation	Assumed
Product Stream		Input	UF Distillate
Type of Substance		Select One	Organic Liquid
Throughput, gal/second	Q	Input	279.853
Vapor Molecular Weight, lb/lbmol	MV	Input	19.84
Vapor Pressure Coefficient A	A	Input	-
Vapor Pressure Coefficient B	B	Input	-
Vapor Pressure Coefficient C	C	Input	-
Effective Diameter, ft	DE	Equation 1-14	7.00
Effective Height, ft	HE	Equation 1-15	10.00
Maximum Liquid Height, ft	HMX	Equation 1-17	9.00
Minimum Liquid Height, ft	HLN	Equation 1-17	1.00
Average Liquid Height, ft	HL	Equation 1-16	4.00
Conic Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0926
Dome Tank Roof Radius, ft	RR	Equation 1-20	7.00
Dome Tank Roof Height, ft	RR	Equation 1-20	0.938
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.4801
Vapor Space Outage, ft	HVO	Equation 1-16	6.48
Vapor Space Volume, ft ³	VV	Equation 1-3	249.38
Average Daily Maximum Ambient Temperature, R	TAM	Table 7-1-7	923.77
Average Daily Maximum Ambient Temperature, R	TAM	Table 7-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	26.10
Average Daily Total Solar Irradiation Factor, Btu/ft ² -day	I	Table 7-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	aS	Table 7-1-6	N/A
Average Daily Vapor Temperature Range, R	ATV	Equation 1-27, 1-18, & 1	20.10
Average Daily Liquid Surface Temperature, R	LTA	Equation 1-27, 1-29, & 2	522.47
Average Daily Minimum Liquid Surface Temperature, R	LTM	Figure 7-1-17	502.37
Average Daily Maximum Liquid Surface Temperature, R	LTX	Figure 7-1-17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, & 2	522.47
Average Vapor Temperature, R	TV	Equation 1-33, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2974
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVM	Equation 1-25, 1-26	0.1542
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.2974
Vapor Density, lb/ft ³	DV	Equation 1-32	0.0011
Daily Vapor Pressure range, psi	DPV	Equation 1-9	0.1445
Breather Vent Pressure Setting, psia	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	BRP	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vertical Vapor Separation Factor	KS	Equation 1-11	0.9973
Net Working Loss Throughput, ft ³	VO	Equation 1-39	37274.2
Sum of Increases in Liquid Level, ft	ZINCL	Equation 1-37	968.52
Annual Turnovers	N	Equation 1-36	121.07
Working Loss Turnover Factor	KN	Equation 1-35	0.41
Working Loss Product Factor	PF	Equation 1-38	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00

Uncontrolled Emissions

Standing Storage Loss, lb/yr	LS	Equation 1-2	3.1453
Working Loss, lb/yr	LW	Equation 1-35	16.263
Total Losses, lb/yr	LT	Equation 1-1	19.408
Total Losses, tpy	LT	N/A	0.0097
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.0532
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0022

Specified Emissions		Uncontrolled	
Formaldehyde, lb	Vapor wt%	1.95E-05	6.35E-06
Methanol		0.0020	0.0005
Total VOC		0.0020	0.0005

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E127
FIN: Rxx-7

Tank Properties	
Tank Identification	Re-7
ICH	N/A
Tank Contents	UF Distillate
Discharging to	Atmosphere
EPN	E127
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Dome
Underground?	Aboveground
Isolated?	Not Isolated
Breather Vent Pressure Setting, psia	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	7.83
Shell Height as Length, ft	15.33
Nominal Capacity, gal	5,528
Shell Paint Color	Stainless Steel
Shell Paint Condition	Good
Shell Insulated?	No
Roof Paint Color	Stainless Steel
Roof Paint Condition	Good
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, °F	62.8
Measured Maximum Liquid Bulk Temperature, °F	63.8
Measured Minimum Liquid Bulk Temperature, °F	62.7
Maximum Number of Heating Cycles per Year	365

Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required if the bulk liquid is heated periodically. Enter the frequency of

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1

Parameter	Symbol	Reference Equation	Annual
Product Stream		Input	UF Distillate
Type of Substance		Select One	Organic Liquid
Throughput, gals/day	Q	Input	555.65
Vapor Molecular Weight, lb/lbmol	MV	Input	19.85
Vapor Pressure Coefficient A	A	Input	—
Vapor Pressure Coefficient B	B	Input	—
Vapor Pressure Coefficient C	C	Input	—
Effective Diameter, ft	DE	Equation 1-14	7.83
Effective Height, ft	HE	Equation 1-15	15.33
Maximum Liquid Height, ft	HMX	Equation 1-17	15.33
Minimum Liquid Height, ft	HLN	Equation 1-17	1.00
Average Liquid Height, ft	HL	Equation 1-16	6.47
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0925
Dome Tank Roof Radius, ft	RR	Equation 1-20	7.83
Dome Tank Roof Height, ft	RR	Equation 1-20	1.049
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.5373
Vapor Space Outage, ft	HVO	Equation 1-16	9.30
Vapor Space Volume, ft ³	VV	Equation 1-3	443.52
Average Daily Maximum Ambient Temperature, °R	TAM	Table 7-1-7	593.37
Average Daily Maximum Ambient Temperature, °R	TAM	Table 7-1-7	522.47
Average Daily Ambient Temperature Range, °R	ΔTA	Equation 1-11	26.10
Average Daily Total Solar Irradiation Factor, Btu/ft ² -day	I	Table 7-1-7	1294
Average Daily Ambient Temperature, °R	TAA	Equation 1-36	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7-1-6	0.68
Tank Shell Solar Absorptance, dimensionless	aS	Table 7-1-6	0.68
Average Daily Vapor Temperature Range, °R	ΔTV	Equation 1-27, 1-28, & 1	20.64
Average Daily Liquid Surface Temperature, °R	TLS	Equation 1-27, 1-28, & 2	520.16
Average Daily Minimum Liquid Surface Temperature, °R	TLM	Figure 7-1-17	500.37
Average Daily Maximum Liquid Surface Temperature, °R	TLS	Figure 7-1-17	525.47
Liquid Bulk Temperature, °R	TB	Equation 1-31, & 2	524.47
Average Vapor Temperature, °R	TV	Equation 1-33, 1-34	513.84
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2841
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVM	Equation 1-25, 1-26	0.1542
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVM	Equation 1-25, 1-26	0.2974
Vapor Density, lb/ft ³	ρV	Equation 1-32	0.0010
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.1495
Breather Vent Pressure Setting, psia	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7-1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0546
Vertical Vapor Separation Factor	KS	Equation 1-11	0.0393
Net Working Loss Throughput, ft ³	VO	Equation 1-39	7199.40
Sum of Increases in Liquid Level, ft	ΔZSL	Equation 1-37	1465.07
Annual Turnovers	N	Equation 1-36	111.36
Working Loss Turnover Factor	KN	Equation 1-35	0.44
Working Loss Product Factor	PF	Equation 1-38	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	7.6762
Working Loss, lb/yr	LW	Equation 1-35	31.2438
Total Losses, lb/yr	LT	Equation 1-1	38.9197
Total Losses, tpy	LT	N/A	0.0197
Avg. Daily Total Losses, lb/day	LAVD	Annualized Daily Average	0.1069
Avg. Hourly Total Losses, lb/hr	LAVH	Annualized Hourly Average	0.0045

Speciated Emissions		Vapor wt%		Uncontrolled	
Formulation		wt%	lb/yr	lb/yr	
Formulation	0.1%	3.88E-05	8.88E-05		
Methanol	20.79%	0.0041	0.0009		
Total VOC	21.89%	0.0041	0.0009		

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E67
FIN: T-4

Tank Properties	Input
Tank Identification	T-4
CR	N/A
Tank Contents	Methanol Distillate
Discharging to	Atmosphere
EPN	E67
Location for Calculation Purposes	Externa, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Insulated?	Outside
Breather Vent Pressure Setting, psia	0
Breather Vent Vacuum Setting, psia	0
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	9.00
Shell Height or Length, ft	N/A
Nominal Capacity, gal	7,138
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference Equation	Annual
Product Stream		Input	Methanol Distillate
Type of Substance		Select One	Organic Liquid
Throughput, gal/annhr	Q	Input	1452.96
Vapor Molecular Weight, lb/lbmol	MV	Input	19.89
Vapor Pressure Coefficient A	A	Input	—
Vapor Pressure Coefficient B	B	Input	—
Vapor Pressure Coefficient C	C	Input	—
Effective Diameter, ft	DE	Equation 1-14	9.00
Effective Height, ft	HE	Equation 1-15	15.00
Maximum Liquid Height, ft	HMX	Equation 1-17	10.00
Minimum Liquid Height, ft	HLN	Equation 1-17	1.00
Average Liquid Height, ft	HL	Equation 1-16	6.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	RR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 + 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	8.50
Vapor Space Volume, ft ³	VV	Equation 1-3	540.75
Average Daily Maximum Ambient Temperature, R	TAM	Table 7-1.7	593.77
Average Daily Maximum Ambient Temperature, R	TAX	Table 7-1.7	572.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.30
Average Daily Total Solar Incident Heat, Btu/ft ² -day	T	Table 7-1.7	1294
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7-1.6	0.64
Tank Shell Solar Absorptance, dimensionless	aS	Table 7-1.6	0.64
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-8, 8-1	29.60
Average Daily Liquid Surface Temperature, R	LTA	Equation 1-27, 1-29, 8-2	516.69
Average Daily Minimum Liquid Surface Temperature, R	LTL	Figure 7-1.17	509.32
Average Daily Maximum Liquid Surface Temperature, R	LTX	Figure 7-1.17	524.07
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	514.73
Average Vapor Temperature, R	TV	Equation 1-33, 1-34	513.66
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2424
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVL	Equation 1-25, 1-26	0.1853
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.3165
Vapor Density, lb/ft ³	DV	Equation 1-32	0.0009
Daily Vapor Pressure range, psi	DPV	Equation 1-9	0.1321
Breather Vent Pressure Setting, psia	PBP	N/A	0.00
Breather Vent Vacuum Setting, psia	PBV	N/A	0.00
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	BRP	Equation 1-10	0.00
Ambient Pressure, psia	PA	Table 7-1.7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0513
Vertical Vapor Separation Factor	KS	Equation 1-11	0.9513
Net Working Loss Throughput, ft ³	VO	Equation 1-39	19147.48
Sum of Losses at Liquid Level, ft	ZLXL	Equation 1-37	395.07
Annual Turnovers	N	Equation 1-36	23.15
Working Loss Turnover Factor	KN	Equation 1-35	1.00
Working Loss Product Factor	WP	Equation 1-38	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	9.1792
Working Loss, lb/yr	LW	Equation 1-35	16.3803
Total Losses, lb/yr	LT	Equation 1-1	24.7530
Total Losses, tpy	LT	N/A	0.0124
Avg. Daily Total Losses, lb/day	LAVD	Annualized Daily Average	0.0678
Avg. Hourly Total Losses, lb/hr	LAVH	Annualized Hourly Average	0.0028

Speciated Emissions		Vapor wt%		Uncontrolled	
Formaldehyde, lb	0.00%			2.15E-05	5.35E-06
Methanol, lb	21.66%			0.0039	0.0009
Total VOC				0.0028	0.0006

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E89
FIN: WW-5

Tank Properties	Input
Tank Identification	WW-5
ICH	N/A
Tank Contents	Mechanol Distillate
Discharging to	Atmosphere
EPN	E89
Location for Calculation Purposes	Externa, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Insulated?	Outside
Breather Vent Pressure Setting, psia	0.03
Breather Vent Vacuum Setting, psia	-0.03
Pressure of Vapor Space at Normal Condition, psia	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	11.59
Shell Height or Length, ft	N/A
Nominal Capacity, gal	18,648
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Loading Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference Equation	Assumed
Product Shipped		Input	Mechanol Distillate
Type of Substance		Select One	Organic Liquid
Throughput, gal/day	Q	Input	70,000
Vapor Molecular Weight, lb/lbmol	MV	Input	59.89
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	11.30
Effective Height, ft	HE	Equation 1-15	24.00
Maximum Liquid Height, ft	HMX	Equation 1-17	21.00
Minimum Liquid Height, ft	HLN	Equation 1-17	1.00
Average Liquid Height, ft	HL	Equation 1-16	11.00
Conic Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	11.00
Vapor Space Volume, ft ³	VV	Equation 1-3	1790.30
Average Daily Maximum Ambient Temperature, R	TAM	Table 7-1.7	593.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7-1.7	592.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	28.08
Average Daily Total Solar Irradiation Factor, Btu/ft ² -day	I	Table 7-1.7	1294
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7-1.6	0.64
Tank Shell Solar Absorptance, dimensionless	aS	Table 7-1.6	0.64
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-8, & 1	26.98
Average Daily Liquid Surface Temperature, R	LTA	Equation 1-27, 1-29, & 2	516.57
Average Daily Minimum Liquid Surface Temperature, R	LTL	Figure 7-1.17	509.20
Average Daily Maximum Liquid Surface Temperature, R	LTX	Figure 7-1.17	523.95
Liquid Bulk Temperature, R	TB	Equation 1-31, & 2	514.73
Average Vapor Temperature, R	TV	Equation 1-33, 1-34	518.43
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2414
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVL	Equation 1-25, 1-26	0.1891
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.3131
Vapor Density, lb/ft ³	DV	Equation 1-32	0.0009
Daily Vapor Pressure range, psi	DPV	Equation 1-9	0.1287
Breather Vent Pressure Setting, psia	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psia	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	BRP	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7-1.7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0531
Vertical Vapor Separation Factor	KS	Equation 1-31	0.0573
Net Working Loss Throughput, ft ³	VO	Equation 1-39	10566.40
Sum of Losses to Liquid Level, ft	ZLZL	Equation 1-37	100.36
Annual Turnovers	N	Equation 1-36	4.56
Working Loss Turnover Factor	KN	Equation 1-35	1.00
Working Loss Product Factor	WP	Equation 1-38	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	10.3491
Working Loss, lb/yr	LW	Equation 1-35	3.9961
Total Losses, lb/yr	LT	Equation 1-1	28.3457
Total Losses, tpy	LT	N/A	0.0142
Avg. Daily Total Losses, lb/day	LAVD	Annualized Daily Average	0.0777
Avg. Hourly Total Losses, lb/hr	LAVH	Annualized Hourly Average	0.0032

Specified Emissions		Uncontrolled	
Vapor wt%		tpy	lb/hr
Formaldehyde, ft	0.00%	2.66E-05	6.08E-06
Methanol	21.47%	0.0030	0.0007
Total VOC		0.0030	0.0007

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E131
FIN: Rx 9

Tank Properties	
Tank Properties	Input
Tank Identification	Rx 9
CIN	N/A
Tank Contents	Triethanolamine (TEA)
Discharging to	Atmosphere
EPN	E131
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	1.92
Shell Height or Length, ft	1.83
Nominal Capacity, gal	40
Shell Paint Color	Stainless Steel
Shell Paint Condition	Aged
Shell Insulated?	No
Roof Paint Color	Stainless Steel
Roof Paint Condition	Aged
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Triethanolamine (TEA)
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	8,153
Vapor Molecular Weight, lb/lbmol	MV	Input	149.19
Vapor Pressure Coefficient A	A	Input	7.19251
Vapor Pressure Coefficient B	B	Input	4543.902
Vapor Pressure Coefficient C	C	Input	24.749
Effective Diameter, ft	DE	Equation 1-14	1.92
Effective Height, ft	HE	Equation 1-15	1.83
Maximum Liquid Height, ft	HLX	Equation 1-37	0.83
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	-0.09
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	1.92
Vapor Space Volume, ft ³	VV	Equation 1-3	5.54
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	0.68
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	0.68
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	30.44
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	517.31
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	509.70
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	524.92
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	514.88
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	519.75
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	6.27E-07
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	2.73E-08
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	9.81E-07
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0000
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0548
Vented Vapor Saturation Factor	KS	Equation 1-21	1.0000
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	1089.83
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	376.41
Annual Turnovers	N	Equation 1-36	-2214.20
Working Loss Turnover Factor	KN	Equation 1-35	1.00
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	0.0000
Total Losses, lb/yr	LT	Equation 1-1	0.0000
Total Losses, tpy	LT	N/A	1.01E-08
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.0000
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0000

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E131
FIN: Rx 9

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: 0
FIN: Wax TEA Tank

Tank Properties	
Tank Properties	Input
Tank Identification	Wax TEA Tank
CIN	N/A
Tank Contents	Triethanolamine (TEA)
Discharging to	Atmosphere
EPN	0
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	10.00
Shell Height or Length, ft	10.00
Nominal Capacity, gal	5,875
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	62.8
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Triethanolamine (TEA)
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	125,660
Vapor Molecular Weight, lb/lbmol	MV	Input	149.19
Vapor Pressure Coefficient A	A	Input	7.19251
Vapor Pressure Coefficient B	B	Input	4543.902
Vapor Pressure Coefficient C	C	Input	24.749
Effective Diameter, ft	DE	Equation 1-14	10.00
Effective Height, ft	HE	Equation 1-15	10.00
Maximum Liquid Height, ft	HLX	Equation 1-37	9.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	4.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	6.00
Vapor Space Volume, ft ³	VV	Equation 1-3	471.24
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	8.50E-07
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	1.73E-08
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	8.50E-07
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0000
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	1.0000
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	16796.62
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	213.86
Annual Turnovers	N	Equation 1-36	26.73
Working Loss Turnover Factor	KN	Equation 1-35	1.00
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0001
Working Loss, lb/yr	LW	Equation 1-35	0.0004
Total Losses, lb/yr	LT	Equation 1-1	0.0005
Total Losses, tpy	LT	N/A	2.60E-07
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.0000
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0000

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: 0
FIN: ST-9

Tank Properties	
Tank Properties	Input
Tank Identification	ST-9
CIN	N/A
Tank Contents	Triethanolamine (TEA)
Discharging to	Atmosphere
EPN	0
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Dome
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	9.00
Shell Height or Length, ft	19.00
Nominal Capacity, gal	9,042
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Triethanolamine (TEA)
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	193,391
Vapor Molecular Weight, lb/lbmol	MV	Input	149.19
Vapor Pressure Coefficient A	A	Input	7.19251
Vapor Pressure Coefficient B	B	Input	4543.902
Vapor Pressure Coefficient C	C	Input	24.749
Effective Diameter, ft	DE	Equation 1-14	9.00
Effective Height, ft	HE	Equation 1-15	19.00
Maximum Liquid Height, ft	HLX	Equation 1-37	18.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	8.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0625
Dome Tank Roof Radius, ft	RR	Equation 1-20	9.00
Dome Tank Roof Height, ft	HR	Equation 1-20	1.206
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.6173
Vapor Space Outage, ft	HVO	Equation 1-16	11.12
Vapor Space Volume, ft ³	VV	Equation 1-3	707.25
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	4.67E-07
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	3.22E-08
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	4.67E-07
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0000
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	1.0000
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	25850.00
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	406.34
Annual Turnovers	N	Equation 1-36	23.90
Working Loss Turnover Factor	KN	Equation 1-35	1.00
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	0.0003
Total Losses, lb/yr	LT	Equation 1-1	0.0003
Total Losses, tpy	LT	N/A	1.64E-07
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.0000
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0000

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E109
FIN: ST-10

Tank Properties	
Tank Properties	Input
Tank Identification	ST-10
CIN	N/A
Tank Contents	Diethylene Glycol
Discharging to	Atmosphere
EPN	E109
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	9.00
Shell Height or Length, ft	14.00
Nominal Capacity, gal	6,662
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Diethylene Glycol
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	2,055,369
Vapor Molecular Weight, lb/lbmol	MV	Input	106.12
Vapor Pressure Coefficient A	A	Input	7.7007954
Vapor Pressure Coefficient B	B	Input	2019.2548
Vapor Pressure Coefficient C	C	Input	173.66153
Effective Diameter, ft	DE	Equation 1-14	9.00
Effective Height, ft	HE	Equation 1-15	14.00
Maximum Liquid Height, ft	HLX	Equation 1-37	13.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	6.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	8.00
Vapor Space Volume, ft ³	VV	Equation 1-3	508.94
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	1.21E-05
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	1.21E-05
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	1.21E-05
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0000
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	1.0000
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	274734.37
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	4318.55
Annual Turnovers	N	Equation 1-36	359.88
Working Loss Turnover Factor	KN	Equation 1-35	0.25
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	0.0161
Total Losses, lb/yr	LT	Equation 1-1	0.0161
Total Losses, tpy	LT	N/A	8.03E-06
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.0000
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0000

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E95
FIN: EW-1

Tank Properties	Input
Tank Identification	EW-1
CIN	N/A
Tank Contents	Emulsified Wax
Discharging to	Atmosphere
EPN	E95
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	10.00
Shell Height or Length, ft	31.00
Nominal Capacity, gal	18,213
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Emulsified Wax
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	4,372,437
Vapor Molecular Weight, lb/mol	MV	Input	56.36
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Height, ft	DE	Equation 1-14	10.00
Effective Diameter, ft	DE	Equation 1-15	31.00
Maximum Liquid Height, ft	HLX	Equation 1-37	30.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	14.90
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 - 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	16.90
Vapor Space Volume, ft ³	VV	Equation 1-3	1,292.91
Average Daily Minimum Ambient Temperature, R	TAN	Table 2-1-7	500.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 2-1-7	522.47
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day		Table 2-1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 2-1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 2-1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, B-2	0.00
Average Daily Liquid Surface Temperature, R	TLS	Equation 1-27, 1-28, B-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLM	Figure 2-1-17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLM	Figure 2-1-17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, B-2	512.42
Anticipate Vapor Temperature, R	TV	Equation 1-25, 1-24	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.3042
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.3042
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVM	Equation 1-25, 1-26	0.3042
Vapor Density, lb/ft ³	ρV	Equation 1-22	0.0021
Daily Vapor Pressure Range, psig	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	BPB	N/A	0.03
Breather Vent Vacuum Setting, psig	BPV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psig	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 2-1-7	14.69
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.8485
Net Working Loss Throughput, lb	VO	Equation 1-39	204465.12
Sum of Increases in Liquid Level, ft	ΣΔQL	Equation 1-37	7445.44
Annual Turnovers	N	Equation 1-36	256.60
Working Loss Turnover Factor	KN	Equation 1-35	0.28
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-10, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Leak, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	346,911.3
Total Losses, lb/yr	LT	Equation 1-1	346,911.3
Total Losses, tpy	LT	N/A	0.9735
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.9504
Dark Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0396

Speciated Emissions	Vapor wt%	Uncontrolled	
		tpy	lb/hr
Stearic Acid	0.00%	3,29E-12	0.0000
Methanol	0.00%	0.0001	0.0000
Tris(2-chloroethyl)amine	0.00%	4,00E-11	9.13E-12
Total VOC	0.00%	0.0001	0.0009

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E96
FIN: EW-2

Tank Properties	
Tank Identification	EW-2
CIN	N/A
Tank Contents	Emulsified Wax
Discharging to	Atmosphere
EPN	E96
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	10.00
Shell Height or Length, ft	31.00
Nominal Capacity, gal	18,213
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Required for temperature controlled or indoor tanks.

Required for temperature controlled or indoor tanks.

Required for temperature controlled or indoor tanks.

Required if the bulk liquid is heated periodically. Enter the frequency c

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Emulsified Wax
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	4,372,437
Vapor Molecular Weight, lb/lbmol	MV	Input	56.36
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	10.00
Effective Height, ft	HE	Equation 1-15	31.00
Maximum Liquid Height, ft	HLX	Equation 1-37	30.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	14.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	16.50
Vapor Space Volume, ft ³	VV	Equation 1-3	1295.91
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 9-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2042
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.2042
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.2042
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0021
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.8485
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	584449.12
Sum of Increases in Liquid Level, ft	ZHQI	Equation 1-37	7441.44
Annual Turnovers	N	Equation 1-36	256.60
Working Loss Turnover Factor	KN	Equation 1-35	0.28
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	346.9113
Total Losses, lb/yr	LT	Equation 1-1	346.9113
Total Losses, tpy	LT	N/A	0.1735
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.9504
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0396

Speciated Emissions		Uncontrolled	
	Vapor wt%	tpy	lb/hr
Stearic Acid	0.00%	3.29E-12	0.0000
Methanol	0.08%	0.0001	0.0000
Triethanolamine	0.00%	4.00E-11	9.13E-12
Total VOC	0.08%	0.0001	0.0000

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E97
FIN: EW-3

Tank Properties	
Tank Identification	EW-3
CIN	N/A
Tank Contents	Emulsified Wax
Discharging to	Atmosphere
EPN	E97
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	10.50
Shell Height or Length, ft	20.00
Nominal Capacity, gal	12,955
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Required for temperature controlled or indoor tanks.

Required for temperature controlled or indoor tanks.

Required for temperature controlled or indoor tanks.

Required if the bulk liquid is heated periodically. Enter the frequency c

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Emulsified Wax
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	3,110.072
Vapor Molecular Weight, lb/lbmol	MV	Input	56.36
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	10.50
Effective Height, ft	HE	Equation 1-15	20.00
Maximum Liquid Height, ft	HLX	Equation 1-37	19.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	11.00
Vapor Space Volume, ft ³	VV	Equation 1-3	952.49
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 9-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2042
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.2042
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.2042
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0021
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.8936
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	415713.00
Sum of Increases in Liquid Level, ft	ZHQI	Equation 1-37	4800.93
Annual Turnovers	N	Equation 1-36	266.72
Working Loss Turnover Factor	KN	Equation 1-35	0.28
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	242.8959
Total Losses, lb/yr	LT	Equation 1-1	242.8959
Total Losses, tpy	LT	N/A	0.1214
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.6655
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0277

Speciated Emissions		Uncontrolled	
	Vapor wt%	tpy	lb/hr
Stearic Acid	0.00%	2.30E-12	0.0000
Methanol	0.08%	0.0001	0.0000
Triethanolamine	0.00%	2.89E-11	6.40E-12
Total VOC	0.08%	0.0001	0.0000

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E98
FIN: EW-4

Tank Properties	
Tank Identification	EW-4
CIN	N/A
Tank Contents	Emulsified Wax
Discharging to	Atmosphere
EPN	E98
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Diameter, ft	11.00
Shell Height or Length, ft	31.00
Nominal Capacity, gal	22,038
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	Yes
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	Yes
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Emulsified Wax
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	5,290,649
Vapor Molecular Weight, lb/lbmol	MV	Input	56.36
Vapor Pressure Coefficient A	A	Input	---
Vapor Pressure Coefficient B	B	Input	---
Vapor Pressure Coefficient C	C	Input	---
Effective Diameter, ft	DE	Equation 1-14	11.00
Effective Height, ft	HE	Equation 1-15	31.00
Maximum Liquid Height, ft	HLX	Equation 1-37	30.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	14.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	16.50
Vapor Space Volume, ft ³	VV	Equation 1-3	1568.05
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	512.42
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	512.42
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	512.42
Liquid Bulk Temperature, R	TB	Equation 1-31, 9-2	512.42
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	512.42
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2042
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.2042
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.2042
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0021
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psia	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.8485
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	707183.44
Sum of Increases in Liquid Level, ft	ZHQI	Equation 1-37	7441.44
Annual Turnovers	N	Equation 1-36	256.60
Working Loss Turnover Factor	KN	Equation 1-35	0.28
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	419.7627
Total Losses, lb/yr	LT	Equation 1-1	419.7627
Total Losses, tpy	LT	N/A	0.2099
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	1.1500
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0479

Speciated Emissions		Uncontrolled	
	Vapor wt%	tpy	lb/hr
Stearic Acid	0.00%	3.98E-12	0.0000
Methanol	0.08%	0.0002	0.0000
Triethanolamine	0.00%	4.84E-11	1.11E-11
Total VOC	0.08%	0.0002	0.0000

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: E111
FIN: ST-17

Tank Properties

Tank Properties	Input
Tank Identification	ST-17
CIN	N/A
Tank Contents	PF Washwater
Discharging to	Atmosphere
EPN	E111
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	9.50
Shell Height or Length, ft	14.00
Nominal Capacity, gal	7,423
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	62.8
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	PF Washwater
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,227,550
Vapor Molecular Weight, lb/lbmol	MV	Input	25.30
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	9.50
Effective Height, ft	HE	Equation 1-15	14.00
Maximum Liquid Height, ft	HLX	Equation 1-37	13.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	6.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	8.00
Vapor Space Volume, ft ³	VV	Equation 1-3	567.06
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.0800
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.0400
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.0800
Vapor Density, lb/ft ³	VV	Equation 1-22	0.0004
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0400
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.9672
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	164082.48
Sum of Increases in Liquid Level, ft	ΣHQL	Equation 1-37	2314.86
Annual Turnovers	N	Equation 1-36	192.91
Working Loss Turnover Factor	KN	Equation 1-35	0.32
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	2.6148
Working Loss, lb/yr	LW	Equation 1-35	19.0855
Total Losses, lb/yr	LT	Equation 1-1	21.7003
Total Losses, tpy	LT	N/A	0.0109
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.0595
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0025

Speciated Emissions	Vapor wt%	Uncontrolled	
		tpy	lb/hr
Methanol	65.75%	7.13E-03	0.0016
Total VOC	65.75%	0.0071	0.0016

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: 0
FIN: ST-8

Tank Properties

Tank Properties	Input
Tank Identification	ST-8
CIN	N/A
Tank Contents	Aqua Ammonia
Discharging to	Atmosphere
EPN	0
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	10.00
Shell Height or Length, ft	20.00
Nominal Capacity, gal	11,750
Shell Paint Color	White
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	White
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Aqua Ammonia
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	344,378
Vapor Molecular Weight, lb/lbmol	MV	Input	17.03
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	10.00
Effective Height, ft	HE	Equation 1-15	20.00
Maximum Liquid Height, ft	HLX	Equation 1-37	19.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	11.00
Vapor Space Volume, ft ³	VV	Equation 1-3	863.94
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.27
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	0.25
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	0.25
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	20.09
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	514.05
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	509.03
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	519.07
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	513.32
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	514.78
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	29.5617
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	26.8900
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	32.4329
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0912
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	5.5429
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.0548
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	46031.92
Sum of Increases in Liquid Level, ft	ΣHQL	Equation 1-37	586.10
Annual Turnovers	N	Equation 1-36	32.56
Working Loss Turnover Factor	KN	Equation 1-35	1.00
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	57.0083
Working Loss, lb/yr	LW	Equation 1-35	4196.2658
Total Losses, lb/yr	LT	Equation 1-1	4253.2742
Total Losses, tpy	LT	N/A	2.1266
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	11.6528
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.4855

Speciated Emissions	Vapor wt%	Uncontrolled	
		tpy	lb/hr
Ammonia	99.49%	2.12	0.4831

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: 0
FIN: C2

Tank Properties

Tank Properties	Input
Tank Identification	C2
CTN	N/A
Tank Contents	50% Caustic
Discharging to	Atmosphere
EPN	0
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	12.00
Shell Height or Length, ft	20.00
Nominal Capacity, gal	16,921
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Heated
Measured Liquid Bulk Temperature, F	81.5
Measured Maximum Liquid Bulk Temperature, F	81.5
Measured Minimum Liquid Bulk Temperature, F	81.5
Maximum Number of Heating Cycles per Year	365

Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required if the bulk liquid is heated periodically. Enter the frequency

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	50% Caustic
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	1,277,888
Vapor Molecular Weight, lb/lbmol	MV	Input	18.02
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	12.00
Effective Height, ft	HE	Equation 1-15	20.00
Maximum Liquid Height, ft	HLX	Equation 1-37	19.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	9.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	11.00
Vapor Space Volume, ft ³	VV	Equation 1-3	1244.07
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	σR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	σS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	0.00
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	541.17
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	541.17
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	541.17
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	541.17
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	541.17
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.3647
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.3647
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.3647
Vapor Density, lb/ft ³	VW	Equation 1-22	0.0011
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0000
Vented Vapor Saturation Factor	KS	Equation 1-21	0.8247
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	170811.07
Sum of Increases in Liquid Level, ft	ΣHQL	Equation 1-37	1510.30
Annual Turnovers	N	Equation 1-36	83.91
Working Loss Turnover Factor	KN	Equation 1-35	0.52
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.0000
Working Loss, lb/yr	LW	Equation 1-35	101.3232
Total Losses, lb/yr	LT	Equation 1-1	101.3232
Total Losses, tpy	LT	N/A	0.0507
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.2776
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0116

Speciated Emissions	Vapor wt%	Uncontrolled	
		tpy	lb/hr
Sodium Hydroxide	0.00%	1.39E-08	3.17E-09

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: 0
FIN: ST-13

Tank Properties

Tank Properties	Input
Tank Identification	ST-13
CTN	N/A
Tank Contents	25% Caustic
Discharging to	Atmosphere
EPN	0
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Dome
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	4.00
Shell Height or Length, ft	5.00
Nominal Capacity, gal	470
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	62.8
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	25% Caustic
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	9,649
Vapor Molecular Weight, lb/lbmol	MV	Input	18.02
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	4.00
Effective Height, ft	HE	Equation 1-15	5.00
Maximum Liquid Height, ft	HLX	Equation 1-37	4.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	1.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0625
Dome Tank Roof Radius, ft	RR	Equation 1-20	4.00
Dome Tank Roof Height, ft	HR	Equation 1-20	0.536
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.2744
Vapor Space Outage, ft	HVO	Equation 1-16	3.77
Vapor Space Volume, ft ³	VV	Equation 1-3	47.43
Average Daily Minimum Ambient Temperature, R	TAM	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.2430
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.1148
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.2430
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0008
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.1281
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.9536
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	1289.79
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	102.64
Annual Turnovers	N	Equation 1-36	34.21
Working Loss Turnover Factor	KN	Equation 1-35	1.00
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.4665
Working Loss, lb/yr	LW	Equation 1-35	1.0072
Total Losses, lb/yr	LT	Equation 1-1	1.4737
Total Losses, tpy	LT	N/A	0.0007
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.0040
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0002

Speciated Emissions	Vapor wt%	Uncontrolled	
		tpy	lb/hr
Sodium Hydroxide	0.00%	1.27E-10	2.91E-11

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: 0
FIN: R4c

Tank Properties

Tank Properties	Input
Tank Identification	R4c
CIN	N/A
Tank Contents	50% Caustic
Discharging to	Atmosphere
EPN	0
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	5.00
Shell Height or Length, ft	16.00
Nominal Capacity, gal	2,350
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	62.8
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	-

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	50% Caustic
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	0
Vapor Molecular Weight, lb/lbmol	MV	Input	18.02
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	5.00
Effective Height, ft	HE	Equation 1-15	16.00
Maximum Liquid Height, ft	HLX	Equation 1-37	15.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	7.00
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	9.00
Vapor Space Volume, ft ³	VV	Equation 1-3	176.71
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: 0
FIN: R4c

Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.1927
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.0911
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.1927
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0006
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.1016
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.9158
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	0.00
Sum of Increases in Liquid Level, ft	ΣHQI	Equation 1-37	0.00
Annual Turnovers	N	Equation 1-36	0.00
Working Loss Turnover Factor	KN	Equation 1-35	1.00
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	1.3234
Working Loss, lb/yr	LW	Equation 1-35	0.0000
Total Losses, lb/yr	LT	Equation 1-1	1.3234
Total Losses, tpy	LT	N/A	0.0007
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.0036
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0002

Speciated Emissions	Vapor wt%	Uncontrolled	
		tpy	lb/hr
Sodium Hydroxide	0.00%	3.43E-10	7.84E-11

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: 0
FIN: R5c

Tank Properties

Tank Properties	Input
Tank Identification	R5c
CTN	N/A
Tank Contents	50% Caustic
Discharging to	Atmosphere
EPN	0
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Indoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	7.00
Shell Height or Length, ft	7.00
Nominal Capacity, gal	2,015
Shell Paint Color	-
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	-
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	62.8
Measured Maximum Liquid Bulk Temperature, F	62.8
Measured Minimum Liquid Bulk Temperature, F	42.7
Maximum Number of Heating Cycles per Year	-

Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required for temperature controlled or indoor tanks.
Required if the bulk liquid is heated periodically. Enter the frequency

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	50% Caustic
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	0
Vapor Molecular Weight, lb/lbmol	MV	Input	18.02
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	7.00
Effective Height, ft	HE	Equation 1-15	7.00
Maximum Liquid Height, ft	HLX	Equation 1-37	6.00
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	2.50
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	4.50
Vapor Space Volume, ft ³	VV	Equation 1-3	173.18
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	N/A
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	N/A
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	20.10
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	522.47
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	502.37
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	522.47
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	522.47
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	522.47
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.1927
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.0911
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.1927
Vapor Density, lb/ft ³	VV	Equation 1-22	0.0006
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.1016
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0362
Vented Vapor Saturation Factor	KS	Equation 1-21	0.9561
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	0.00
Sum of Increases in Liquid Level, ft	ΣHQL	Equation 1-37	0.00
Annual Turnovers	N	Equation 1-36	0.00
Working Loss Turnover Factor	KN	Equation 1-35	1.00
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	1.3539
Working Loss, lb/yr	LW	Equation 1-35	0.0000
Total Losses, lb/yr	LT	Equation 1-1	1.3539
Total Losses, tpy	LT	N/A	0.0007
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	0.0037
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.0002

Speciated Emissions	Vapor wt%	Uncontrolled	
		tpy	lb/hr
Sodium Hydroxide	0.00%	3.51E-10	8.02E-11

tion, Inc.
Oboil Plant

Tank Parameters	Input
Diameter, ft	3.00
Shell Height or Length, ft	4.50
Nominal Capacity, gal	382
Shell Paint Color	Stainless Steel
Shell Paint Finish	Polished
Shell Insulated?	No
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, °F	
Measured Maximum Liquid Bulk Temperature, °F	
Measured Minimum Liquid Bulk Temperature, °F	
Maximum Number of Heating Cycles per Year	365

Tank Parameters	Input
Diameter, ft	3.00
Shell Height or Length, ft	4.50
Nominal Capacity, gal	382
Shell Paint Color	Stainless Steel
Shell Paint Finish	Polished
Shell Insulated?	No
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, °F	
Measured Maximum Liquid Bulk Temperature, °F	
Measured Minimum Liquid Bulk Temperature, °F	
Maximum Number of Heating Cycles per Year	365

Tank Parameters	Input
Diameter, ft	3.00
Shell Height or Length, ft	4.50
Nominal Capacity, gal	382
Shell Paint Color	Stainless Steel
Shell Paint Finish	Polished
Shell Insulated?	No
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, °F	
Measured Maximum Liquid Bulk Temperature, °F	
Measured Minimum Liquid Bulk Temperature, °F	
Maximum Number of Heating Cycles per Year	365

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: 0
FIN: SM2

Tank Properties	Input
Tank Identification	SM2
CIN	N/A
Tank Contents	FM-6310L
Discharging to	Atmosphere
EPN	0
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	3.80
Shell Height or Length, ft	4.50
Nominal Capacity, gal	382
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	FM-6310L
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	27,422,609
Vapor Molecular Weight, lb/dmol	MV	Input	18.04
Vapor Pressure Coefficient A	A	Input	
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	3.80
Effective Height, ft	HE	Equation 1-15	4.50
Maximum Liquid Height, ft	HLX	Equation 1-37	3.50
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	1.25
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	3.25
Vapor Space Volume, ft ³	VV	Equation 1-3	36.86
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.67
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7.1-6	0.64
Tank Shell Solar Absorptance, dimensionless	aS	Table 7.1-6	0.64
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-8, 8-1	29.48
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	516.89
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	509.52
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	524.26
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	514.73
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	519.06
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4529
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4529
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVM	Equation 1-25, 1-26	0.4529
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0015
Daily Vapor Pressure range, psi	APV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	BPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0531
Vented Vapor Saturation Factor	KS	Equation 1-21	0.9276
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	3665488.74
Sum of Increases in Liquid Levels, ft	ΣHQL	Equation 1-37	323002.58
Annual Turnovers	N	Equation 1-36	129281.03
Working Loss Turnover Factor	KN	Equation 1-35	0.17
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.9713
Working Loss, lb/yr	LW	Equation 1-35	897.2292
Total Losses, lb/yr	LT	Equation 1-1	898.20
Total Losses, tpy	LT	N/A	0.44491
Avg. Daily Total Losses, lb/day	LAvg	Annualized Daily Average	2.4668
Avg. Hourly Total Losses, lb/hr	LAvg	Annualized Hourly Average	0.1025

Speciated Emissions	Uncontrolled	
	Vapor wt%	lb/hr
Formaldehyde	0.12%	0.0006
Methanol	0.00%	0.0000
Methylene Glycol	0.01%	0.0000
Hemiformal	0.00%	0.0000
Total VOC	0.13%	0.0006

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: 0
FIN: SM3

Tank Properties	
Tank Properties	Input
Tank Identification	SM3
CIN	N/A
Tank Contents	FM-7480L
Discharging to	Atmosphere
EPN	0
Location for Calculation Purposes	Eugene, OR
Tank / Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	
Tank Parameters	Input
Diameter, ft	3.80
Shell Height or Length, ft	4.50
Nominal Capacity, gal	382
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.			
Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	FM-7400L
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	75,085,714
Vapor Molecular Weight, lb/mol	MV	Input	18.02
Vapor Pressure Coefficient A	A	Input	--
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	3.80
Effective Height, ft	HE	Equation 1-15	4.50
Maximum Liquid Height, ft	HLX	Equation 1-37	3.50
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	1.25
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 -- 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	3.25
Vapor Space Volume, ft ³	VV	Equation 1-3	36.86
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.47
Average Daily Ambient Temperature Range, R	ΔTA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	αR	Table 7.1-6	0.64
Tank Shell Solar Absorptance, dimensionless	αS	Table 7.1-6	0.64
Average Daily Vapor Temperature Range, R	ΔTV	Equation 1-7, 1-8, 8-1	29.48
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	516.89
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7.1-17	509.52
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7.1-17	524.26
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	514.73
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	519.06
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.4529
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.4529
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVX	Equation 1-25, 1-26	0.4529
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0015
Daily Vapor Pressure range, psi	ΔPV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	ΔPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0531
Vented Vapor Saturation Factor	KS	Equation 1-21	0.9276
Net Working Loss Throughput, ft ³	VQ	Equation 1-39	10036457.10
Sum of Increases in Liquid Level, ft	ΣHQIL	Equation 1-37	884959.42
Annual Turnovers	N	Equation 1-36	353983.77
Working Loss Turnover Factor	KN	Equation 1-35	0.17
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	0.9703
Working Loss, lb/yr	LW	Equation 1-35	2453.1225
Total Losses, lb/yr	LT	Equation 1-1	2,453.09
Total Losses, tpy	LT	N/A	1.2265
Avg. Daily Total Losses, lb/day	LAVG	Annualized Daily Average	6.7208
Avg. Hourly Total Losses, lb/hr	LAVG	Annualized Hourly Average	0.2800

Speciated Emissions		Uncontrolled	
	Vapor wt%	tpy	lb/hr
Formaldehyde	0.00%	0.0000	0.0000
Methanol	0.00%	0.0000	0.0000
Methylene Glycol	0.00%	0.0000	0.0000
Hemiformal	0.00%	0.0000	0.0000
Total VOC	0.00%	0.0000	0.0000

Hexion, Inc.
Springfield Plant - Springfield, OR
EPN: 0
FIN: SM4

Tank Properties	Input
Tank Identification	SM4
CIN	N/A
Tank Contents	Momentive 4720
Discharging to	Atmosphere
EPN	0
Location for Calculation Purposes	Eugene, OR
Tank/Roof Type	Flat
Underground?	Aboveground
Indoor?	Outdoor
Breather Vent Pressure Setting, psig	0.03
Breather Vent Vacuum Setting, psig	-0.03
Pressure of Vapor Space at Normal Condition, psig	0
Tank Vapor Balanced and Flashing Occurs?	No
Emission Control Method	No Control
Emission Control Efficiency	0

Tank Parameters	Input
Diameter, ft	3.80
Shell Height or Length, ft	4.50
Nominal Capacity, gal	382
Shell Paint Color	Stainless Steel
Shell Paint Condition	Average
Shell Insulated?	No
Roof Paint Color	Stainless Steel
Roof Paint Condition	Average
Roof Insulated?	No
Temperature Controlled or Atmospheric?	Atmospheric
Measured Liquid Bulk Temperature, F	
Measured Maximum Liquid Bulk Temperature, F	
Measured Minimum Liquid Bulk Temperature, F	
Maximum Number of Heating Cycles per Year	365

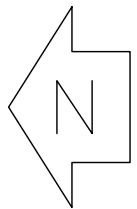
Emission Calculation - Calculation performed in accordance with AP-42, March 2020, Section 7.1.3.1.

Parameter	Symbol	Reference/Equation	Annual
Product Stored		Input	Momentive 4720
Type of Substance		Select One	Organic Liquid
Throughput, gallons/yr	Q	Input	13,770,000
Vapor Molecular Weight, lb/dmol	MV	Input	24.05
Vapor Pressure Coefficient A	A	Input	
Vapor Pressure Coefficient B	B	Input	--
Vapor Pressure Coefficient C	C	Input	--
Effective Diameter, ft	DE	Equation 1-14	3.80
Effective Height, ft	HE	Equation 1-15	4.50
Maximum Liquid Height, ft	HLX	Equation 1-37	3.50
Minimum Liquid Height, ft	HLN	Equation 1-37	1.00
Average Liquid Height, ft	HL	Equation 1-16	1.25
Cone Tank Roof Slope, ft/ft	SR	Equation 1-18	0.0000
Dome Tank Roof Radius, ft	RR	Equation 1-20	N/A
Dome Tank Roof Height, ft	HR	Equation 1-20	N/A
Roof Outage, ft	HRO	Equation 1-17 ~ 1-19	0.0000
Vapor Space Outage, ft	HVO	Equation 1-16	3.25
Vapor Space Volume, ft ³	VV	Equation 1-3	36.86
Average Daily Minimum Ambient Temperature, R	TAN	Table 7.1-7	502.37
Average Daily Maximum Ambient Temperature, R	TAX	Table 7.1-7	522.67
Average Daily Ambient Temperature Range, R	ATA	Equation 1-11	20.10
Average Daily Total Solar Insolation Factor, Btu/ft ² -day	I	Table 7.1-7	1204
Average Daily Ambient Temperature, R	TAA	Equation 1-30	512.42
Tank Roof Solar Absorptance, dimensionless	aR	Table 7.1-6	0.64
Tank Shell Solar Absorptance, dimensionless	aS	Table 7.1-6	0.64
Average Daily Vapor Temperature Range, R	ATV	Equation 1-7, 1-8, 8-1	29.48
Average Daily Liquid Surface Temperature, R	TLA	Equation 1-27, 1-29, 8-2	516.89
Average Daily Minimum Liquid Surface Temperature, R	TLN	Figure 7-1.17	509.52
Average Daily Maximum Liquid Surface Temperature, R	TLX	Figure 7-1.17	524.26
Liquid Bulk Temperature, R	TB	Equation 1-31, 8-2	514.73
Average Vapor Temperature, R	TV	Equation 1-32, 1-34	519.06
Vapor Pressure at Avg. Daily Liquid Surf. Temp., psia	PVA	Equation 1-25, 1-26	0.5780
Vapor Pressure at Avg. Daily Min. Liquid Surf. Temp., psia	PVN	Equation 1-25, 1-26	0.5780
Vapor Pressure at Avg. Daily Max. Liquid Surf. Temp., psia	PVM	Equation 1-25, 1-26	0.5780
Vapor Density, lb/ft ³	WV	Equation 1-22	0.0025
Daily Vapor Pressure range, psi	APV	Equation 1-9	0.0000
Breather Vent Pressure Setting, psig	PBP	N/A	0.03
Breather Vent Vacuum Setting, psig	PBV	N/A	-0.03
Pressure of Vapor Space at Normal Condition, psig	PI	Equation 1-41	0
Breather Vent Pressure Setting Range, psi	BPB	Equation 1-10	0.06
Ambient Pressure, psia	PA	Table 7.1-7	14.50
Vapor Space Expansion Factor	KE	Equation 1-5, 1-12	0.0531
Vented Vapor Saturation Factor	KS	Equation 1-21	0.9095
Net Working Loss Throughput, ft ³	WQI	Equation 1-39	1946590.00
Sum of Increases in Liquid Levels, ft	ΣHQL	Equation 1-37	162293.07
Annual Turnovers	N	Equation 1-36	64917.23
Working Loss Turnover Factor	KN	Equation 1-35	0.17
Working Loss Product Factor	KP	Equation 1-35	1.00
Vent Setting Correction Factor	KB	Equation 1-40, 1-41	1.00
Uncontrolled Emissions			
Standing Storage Loss, lb/yr	LS	Equation 1-2	1.6203
Working Loss, lb/yr	LW	Equation 1-35	767.6621
Total Losses, lb/yr	LT	Equation 1-1	769.28
Total Losses, tpy	LT	N/A	0.3946
Avg. Daily Total Losses, lb/day	LAvg	Annualized Daily Average	2.1076
Avg. Hourly Total Losses, lb/hr	LAvg	Annualized Hourly Average	0.0878

Speciated Emissions	Uncontrolled		
	Vapor wt%	tpy	lb/hr
Formaldehyde	0.13%	0.0005	0.0001
Methanol	41.06%	0.1579	0.0361
Methylene Glycol	0.01%	0.0000	0.0000
Hemiformal	0.58%	0.0022	0.0005
Total VOC	41.78%	0.1607	0.0367

Attachment 3

Springfield Facility Plot Plan



PREVAILING WINDS

B STREET

Drying Pad

RAIL SUMP

RAILCAR UNLOADING STATION #9 (MS)

RAILCAR UNLOADING STATION #8

FORMALDEHYDE STORAGE

Front Office

Phenolic Resin Storage

Truck Scale

COOLING TOWER #4

TRUCK LOADING STATION #3

BOILER

Wax Plant

TRUCK LOADING STATION #2

Office

Shop

Phenolic Pit

Flammable Storage

Chiller

TRUCK LOADING STATION #1

Catalyst Plant

BAGGING AREA

RAMP DOWN

Resin Production

Resin Warehouse

Truck Wash

TRUCK LOADING STATION #4

TRUCK UNLOADING STATION #7

RAILCAR UNLOADING STATION #6

RAILCAR UNLOADING STATION #5

COOLING TOWER #5

City Pit

Old pit

UREA SHELTER

UREA PIT

ST-149 MEA

ST-5

ST-6

ST-17

ST-18

ST-19

ST-20

ST-21

ST-22

ST-23

ST-24

ST-25

ST-26

ST-27

ST-28

ST-29

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ST-31

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ST-36

ST-37

ST-38

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ST-40

ST-41

ST-42

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ST-44

ST-45

ST-46

ST-47

DESCRIPTION	ELECTRICAL AREA CLASSIFICATION DRAWING NO.:
SITE PLAN AND DRAWING INDEX	083-E-10-001-A
FORMALDEHYDE STORAGE	083-E-02-002
FORMALDEHYDE #2 & #3	083-E-03&09-003
RESINS TANK FARM	083-E-04-004
PHENOLIC RESINS BUILDING	083-E-05-005
RESINS WAREHOUSE & PRODUCTION	083-E-07-006
RESINS WAREHOUSE & PRODUCTION	083-E-07-007
METHANOL STORAGE AREA	083-E-08-008
EMERGENCY SPILL COLL. BASINS	083-E-10-009
CATALYST UNIT	083-E-06-010

NOTES:

- 1) THE ELECTRICAL CLASSIFICATIONS SHOWN ON THE DRAWINGS REFERENCED BELOW CONFORM TO NATIONAL FIRE PROTECTION ASSOCIATION NFPA 497 "RECOMMENDED PRACTICE FOR THE CLASSIFICATION OF FLAMMABLE LIQUIDS, GASES, OR VAPORS AND OF HAZARDOUS (CLASSIFIED) LOCATIONS FOR ELECTRICAL INSTALLATIONS IN CHEMICAL PROCESS AREAS" AND NFPA 499 "RECOMMENDED PRACTICE FOR THE CLASSIFICATION OF COMBUSTIBLE DUSTS AND OF HAZARDOUS (CLASSIFIED) LOCATIONS FOR ELECTRICAL INSTALLATIONS IN CHEMICAL PROCESS AREAS".
- 2) PIPE BRIDGES SUPPORTING PIPING CONTAINING FLAMMABLE LIQUIDS AND COMBUSTIBLE LIQUIDS HEATED AT OR ABOVE THEIR FLASH POINT WITH VALVES, FLANGES, METERS, ETC. SHALL BE CLASSIFIED CLASS 1, DIVISION 2.

REFERENCE DRAWINGS

LINE NO.	SERIES	LAST NO. USED
INST. NO.	XXXX	XXXX
REV.	DATE	DESCRIPTION
3	06/29/18	HAC UPDATES
2	12/09/09	GENERAL HAC REVISIONS
1	08/11/09	UPDATES PER ANDREA PEREZ
0	02/15/06	CDI/PSM UPDATE
REV.	DATE	DESCRIPTION



FORMALDEHYDE AND FOREST PRODUCTS DIVISION
SPRINGFIELD, OR

ELECTRICAL AREA CLASSIFICATION
SITE PLAN DRAWING INDEX

THIS DRAWING IS THE PROPERTY OF HEXION, INC. AND MUST BE RETURNED, WITHOUT REPRODUCTION OR DUPLICATION, AT ANY TIME UPON REQUEST, BUT IN ANY EVENT AT COMPLETION OF THE WORK OR JOB. WHILE IN THE POSSESSION OF THE RECIPIENT IT MUST BE PROPERLY SAFEGUARDED AGAINST DISCLOSURE TO ANYONE EXCEPT THOSE EMPLOYEES WHO REQUIRE IT FOR THE WORK OR JOB. THE RECIPIENT MUST KEEP CONFIDENTIAL AND REQUIRE HIS (ITS) EMPLOYEES TO KEEP CONFIDENTIAL THE INFORMATION CONTAINED HEREON.



DRAWN BY: J. SIGMON	CHECKED BY: SEE REV. BOX
ENGINEER: J. DEROO	DESIGNER:
PROJECT NO: B15.61842.SA	DWG NO: 083-E-10-001-A
SCALE: NONE	REV. 3