

Emission Estimates for Methylene Chloride (I-03) Post-Modification (Revised 1/13/2023)

Emissions

It is assumed that the Methylene Chloride emissions from the brine system would increase proportionally to the additional equipment / components that are added as a result of the modification. Based on process knowledge, it has been assumed that Methylene Chloride connections would increase by 20%.

Post Modification Increase = 20%

Compound Name		CY2021 Uncontrolled Emissions (lb/yr)	Uncontrolled Emission Factor (lb/kg)	Waste DMSO Tank Post-Mod Uncontrolled Emissions (lb/yr)	TO Control Efficiency (%)	Waste DMSO Tank Post-Mod Controlled Emissions (lb/yr)
A.	MeCl	4,399.00	--	5,278.80	--	5,278.80
TOTAL VOC⁽¹⁾		4,399.00	--	5,278.80	--	5,278.80

Note: Process emissions from I-03 are not controlled by the Thermal Oxidizer.

NATURAL GAS COMBUSTION EMISSIONS CALCULATOR REVISION N 01/05/2017 - OUTPUT SCREEN



Instructions: Enter emission source / facility data on the "INPUT" tab/screen. The air emission results and summary of input data are viewed / printed on the "OUTPUT" tab/screen. The different tabs are on the bottom of this screen.

This spreadsheet is for your use only and should be used with caution. NCDEQ does not guarantee the accuracy of the information contained. This spreadsheet is subject to continual revision and updating. It is your responsibility to be aware of the most current information available. NCDEQ is not responsible for errors or omissions that may be contained herein.

SOURCE / FACILITY / USER INPUT SUMMARY (FROM INPUT SCREEN)

COMPANY:	Chemours Company - Fayetteville Works		FACILITY ID NO.:	900009
EMISSION SOURCE DESCRIPTION:	139.4 MMBTU/HR NATURAL GAS-FIRED BOILER		PERMIT NUMBER:	03735T48
EMISSION SOURCE ID NO.:	PS-A		FACILITY CITY:	Fayetteville
CONTROL DEVICE:	NO CONTROL		FACILITY COUNTY:	Bladen
SPREADSHEET PREPARED BY:	Christel Compton		POLLUTANT	CONTROL EFF.
ACTUAL FUEL THROUGHPUT:	54.31	10 ⁶ SCF/YR	NOX	CALCD AS 0%
POTENTIAL FUEL THROUGHPUT:	1,197.20	10 ⁶ SCF/YR	BOILER TYPE:	LARGE WALL-FIRED BOILER (> 100 mmBTU/HR)
REQUESTED MAX. FUEL THRPT:	1,197.20	10 ⁶ SCF/YR	HOURS OF OPERATIONS:	24
				NO SNCR APPLIED

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION

AIR POLLUTANT EMITTED	ACTUAL EMISSIONS		POTENTIAL EMISSIONS				EMISSION FACTOR	
	(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)		lb/mmBtu	
	lb/hr	tons/yr	lb/hr	tons/yr	lb/hr	tons/yr	uncontrolled	controlled
PARTICULATE MATTER (Total)	0.07	0.01	0.07	0.31	0.07	0.31	0.001	0.001
PARTICULATE MATTER (Filterable)	0.03	0.01	0.03	0.12	0.03	0.12	0.000	0.000
PARTICULATE MATTER (Condensable)	0.04	0.01	0.04	0.19	0.04	0.19	0.000	0.000
PM 2.5 (Total)	0.06	0.01	0.06	0.26	0.06	0.26	0.000	0.000
PM 2.5 (Filterable)	0.02	0.00	0.02	0.07	0.02	0.07	0.000	0.000
SULFUR DIOXIDE (SO2)	0.08	0.02	0.08	0.36	0.08	0.36	0.001	0.001
NITROGEN OXIDES (NOx)	25.97	5.16	25.97	113.73	25.97	113.73	0.186	0.186
CARBON MONOXIDE (CO)	11.48	2.28	11.48	50.28	11.48	50.28	0.082	0.082
VOLATILE ORGANIC COMPOUNDS (VOC)	0.75	0.15	0.75	3.29	0.75	3.29	0.005	0.005

TOXIC / HAZARDOUS AIR POLLUTANT EMISSIONS INFORMATION

TOXIC / HAZARDOUS AIR POLLUTANT	CAS NUMBER	ACTUAL EMISSIONS		POTENTIAL EMISSIONS				EMISSION FACTOR	
		(AFTER CONTROLS / LIMITS)		(BEFORE CONTROLS / LIMITS)		(AFTER CONTROLS / LIMITS)		lb/mmBtu	
		lb/hr	lbs/yr	lb/hr	lbs/yr	lb/hr	lbs/yr	uncontrolled	controlled
Acetaldehyde (TH)	75070	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein (TH)	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (T)	7664417	4.37E-01	1.74E+02	4.37E-01	3.83E+03	4.37E-01	3.83E+03	3.14E-03	3.14E-03
Arsenic unlisted compounds (TH)	ASC-other	2.73E-05	1.09E-02	2.73E-05	2.39E-01	2.73E-05	2.39E-01	1.96E-07	1.96E-07
Benzene (TH)	71432	2.87E-04	1.14E-01	2.87E-04	2.51E+00	2.87E-04	2.51E+00	2.06E-06	2.06E-06
Benzo(a)pyrene (TH)	50328	1.64E-07	6.52E-05	1.64E-07	1.44E-03	1.64E-07	1.44E-03	1.18E-09	1.18E-09
Beryllium metal (unreacted) (TH)	7440417	1.64E-06	6.52E-04	1.64E-06	1.44E-02	1.64E-06	1.44E-02	1.18E-08	1.18E-08
Cadmium metal (elemental unreacted) (TH)	7440439	1.50E-04	5.97E-02	1.50E-04	1.32E+00	1.50E-04	1.32E+00	1.08E-06	1.08E-06
Chromic acid (VI) (TH)	7738945	1.91E-04	7.60E-02	1.91E-04	1.68E+00	1.91E-04	1.68E+00	1.37E-06	1.37E-06
Cobalt unlisted compounds (H)	COC-other	1.15E-05	4.56E-03	1.15E-05	1.01E-01	1.15E-05	1.01E-01	8.24E-08	8.24E-08
Formaldehyde (TH)	50000	1.03E-02	4.07E+00	1.03E-02	8.98E+01	1.03E-02	8.98E+01	7.35E-05	7.35E-05
Hexane, n- (TH)	110543	2.46E-01	9.78E+01	2.46E-01	2.15E+03	2.46E-01	2.15E+03	1.76E-03	1.76E-03
Lead unlisted compounds (H)	PBC-other	6.83E-05	2.72E-02	6.83E-05	5.99E-01	6.83E-05	5.99E-01	4.90E-07	4.90E-07
Manganese unlisted compounds (TH)	MNC-other	5.19E-05	2.06E-02	5.19E-05	4.55E-01	5.19E-05	4.55E-01	3.73E-07	3.73E-07
Mercury vapor (TH)	7439976	3.55E-05	1.41E-02	3.55E-05	3.11E-01	3.55E-05	3.11E-01	2.55E-07	2.55E-07
Napthalene (H)	91203	8.34E-05	3.31E-02	8.34E-05	7.30E-01	8.34E-05	7.30E-01	5.98E-07	5.98E-07
Nickel metal (TH)	7440020	2.87E-04	1.14E-01	2.87E-04	2.51E+00	2.87E-04	2.51E+00	2.06E-06	2.06E-06
Selenium compounds (H)	SEC	3.28E-06	1.30E-03	3.28E-06	2.87E-02	3.28E-06	2.87E-02	2.35E-08	2.35E-08
Toluene (TH)	108883	4.65E-04	1.85E-01	4.65E-04	4.07E+00	4.65E-04	4.07E+00	3.33E-06	3.33E-06
Total HAPs		2.58E-01	1.03E+02	2.58E-01	2.26E+03	2.58E-01	2.26E+03	1.85E-03	1.85E-03
Highest HAP	Hexane	2.46E-01	9.78E+01	2.46E-01	2.15E+03	2.46E-01	2.15E+03	1.76E-03	1.76E-03

TOXIC AIR POLLUTANT EMISSIONS INFORMATION (FOR PERMITTING PURPOSES)

TOXIC AIR POLLUTANT	CAS Num.	EXPECTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS			EMISSION FACTOR	
		lb/hr	lb/day	lb/yr	uncontrolled	controlled
Acetaldehyde (TH)	75070	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acrolein (TH)	107028	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ammonia (T)	7664417	4.37E-01	1.05E+01	1.74E+02	3.14E-03	3.14E-03
Arsenic unlisted compounds (TH)	ASC-other	2.73E-05	6.56E-04	1.09E-02	1.96E-07	1.96E-07
Benzene (TH)	71432	2.87E-04	6.89E-03	1.14E-01	2.06E-06	2.06E-06
Benzo(a)pyrene (TH)	50328	1.64E-07	3.94E-06	6.52E-05	1.18E-09	1.18E-09
Beryllium metal (unreacted) (TH)	7440417	1.64E-06	3.94E-05	6.52E-04	1.18E-08	1.18E-08
Cadmium metal (elemental unreacted) (TH)	7440439	1.50E-04	3.61E-03	5.97E-02	1.08E-06	1.08E-06
Soluble chromate compounds, as chromium (VI) equivalent	SoICR6	1.91E-04	4.59E-03	7.60E-02	1.37E-06	1.37E-06
Formaldehyde (TH)	50000	1.03E-02	2.46E-01	4.07E+00	7.35E-05	7.35E-05
Hexane, n- (TH)	110543	2.46E-01	5.90E+00	9.78E+01	1.76E-03	1.76E-03
Manganese unlisted compounds (TH)	MNC-other	5.19E-05	1.25E-03	2.06E-02	3.73E-07	3.73E-07
Mercury vapor (TH)	7439976	3.55E-05	8.53E-04	1.41E-02	2.55E-07	2.55E-07
Nickel metal (TH)	7440020	2.87E-04	6.89E-03	1.14E-01	2.06E-06	2.06E-06
Toluene (TH)	108883	4.65E-04	1.12E-02	1.85E-01	3.33E-06	3.33E-06

GREENHOUSE GAS EMISSIONS INFORMATION (FOR EMISSIONS INVENTORY PURPOSES) - CONSISTENT WITH EPA MANDATORY REPORTING RULE (MRR) METHOD

GHG - POTENTIAL TO EMIT NOT BASED ON EPA MRR METHOD

GREENHOUSE GAS POLLUTANT	ACTUAL EMISSIONS			POTENTIAL EMISSIONS	
	EPA MRR CALCULATION METHOD: TIER 1				
	metric tons/yr	metric tons/yr, CO2e	short tons/yr	short tons/yr	short tons/yr, CO2e
CARBON DIOXIDE (CO2)	2960.37	2,960.37	3,263.25	71,369.12	71369.12
METHANE (CH4)	5.58E-02	1.40E+00	6.15E-02	1.35E+00	3.37E+01
NITROUS OXIDE (N2O)	5.58E-03	1.66E+00	6.15E-03	1.35E-01	4.01E+01
		TOTAL CO2e (metric tons)			TOTAL CO2e (short tons)
		2,963.43			71,442.89

NOTE: CO2e means CO2 equivalent

NOTE: The DAQ Air Emissions Reporting Online (AERO) system requires short tons to be reported. The EPA MRR requires metric tons to be reported.

NOTE: Do not use greenhouse gas emission estimates from this spreadsheet for PSD (Prevention of Significant Deterioration) purposes.

Chemours – Vinyl Ethers Expansion Permit Application
 HFPO – Dimer Acid Projected Emissions

Process Unit		Existing Controls	Additional Controls ¹	Controls Added Year	Projected Emissions (lb/yr)					
					2023	2024	2025	2026	2027	2028
VE-North (PPVE)	Indoor Equipment Emissions	Carbon Bed (Existing)	VEN Carbon Bed (Upgrades)	2023	3.74	3.71	3.42	4.02	3.42	3.83
	Transition Emissions	Carbon Bed (Existing)	None		0.007	0.007	0.007	0.007	0.007	0.007
VE-North (EVE)	Indoor Equipment Emissions	Carbon Bed (Existing)	VEN Carbon Bed (Upgrades)	2023	0.33	0.35	0.35	0.35	0.38	0.38
	Transition Emissions	Carbon Bed (Existing)	None		0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
VE-North (PSEPVE)	Indoor Equipment Emissions	Carbon Bed (Existing)	VEN Carbon Bed (Upgrades)	2023	6.30	8.01	6.67	8.64	7.25	5.98
	Transition Emissions	Carbon Bed (Existing)	None		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
VE-North Outdoor Equipment Emissions & Accidental Releases	Outdoor Equipment Emissions		VEN Carbon Bed (Upgrades)		2.61	2.59	2.39	2.81	2.39	2.67
	Accidental Release Emissions		None		0.46	0.46	0.46	0.46	0.46	0.46
VE-South (PMVE/PEVE)	Indoor Equipment Emissions	Carbon Bed (Existing)	None		0.47	0.43	0.44	0.46	0.47	0.48
	Transition Emissions	Carbon Bed (Existing)	None		0	0.00004	0	0	0.00004	-
VE-South (PPVE)	Indoor Equipment Emissions	Carbon Bed (Existing)	None		0.48	0.63	0	0	0.78	-
	Transition Emissions	Carbon Bed (Existing)	None		0	0.003	0	0	0.003	-
VE-South Outdoor Equipment Emissions, Accidental Releases, Isotainer Venting	Outdoor Equipment Emissions		None		0.24	0.31	0	0	-	-
	Accidental Release Emissions		None		0.07	0.07	0.07	0.07	-	-
	Isotainer Venting	Thermal Oxidizer (Existing)	None		0.01	0.01	0.01	0.01	0.01	0.01
PPA	Indoor Equipment Emissions	Carbon Bed (Existing)	None		0.07	0.07	0.07	0.07	0.07	0.07
PPA Outdoor Equipment Emissions & Isotainer Venting	Outdoor Equipment Emissions		None		0.64	0.64	0.64	0.64	0.64	0.64
	Isotainer Venting	Carbon Bed (Existing)	None		0.22	0.22	0.22	0.22	0.22	0.22
Semi-Works - High EW Polymers	Indoor Equipment Emissions	Carbon Bed (Existing)	Thermal Oxidizer (Existing)	2024	0.23	0.000001	0.000001	0.000001	-	-
Semi-Works - DP	Indoor Equipment Emissions	Carbon Bed (Existing)	Thermal Oxidizer (Existing)	2024	1.06	0.00001	0.00001	0.00001	0.00001	0.00001
E2	Indoor Equipment Emissions	Thermal Oxidizer (Existing)	None		0.08	0.07	0.09	0.11	0.14	0.17
Polymers	Indoor Equipment Emissions	Thermal Oxidizer (Existing)	None		1.07	1.09	0.87	0.94	1.06	1.07
Thermal Oxidizer	Emissions		N/A		0.048	0.051	0.049	0.051	0.049	0.051
Total Emissions (lb/yr)					18.11	18.73	15.77	18.86	17.34	16.03

Table with columns for Compound Name, CAS No., HAP/TAP, Fluorinated Organic Compounds (FOC), and various emission categories: HFPO (NS-A) - 2021, HFPO (NS-A) - Proposed, VEN (NS-B) - 2021, VEN (NS-B) - Proposed (Actual Hours), VES (NS-C) - 2021, VES (NS-C) - Proposed (Actual Hours), HFPO Cont Decon (NS-N) - 2021, HFPO Cont Decon (NS-N) - Proposed, VEN Cont Decon (NS-O) - 2021, VEN Cont Decon (NS-O) - Proposed. Rows list numerous compounds like HFPO, HFP, COF2, PAF, PMCP, A/F Solvent, Benzene, Toluene, SO2, HF, PPF, Diallylme, AN, ADN, TTG, DA, MA, TA, RSU, MAE, MMF, DAE, TAE, HFPO Trimer, EVE, PSEVE, hydro-EVE, iso-EVE, C4, C5, TFE, Hydro-PSEPVE, iso-PSEPVE, BWP, BPP, PMVE, PEVE, MD, HydroPEVE, E-1, E-2, E-3, Ethanol, n-Propanol, Isopropanol, PM, PM-10, PM-2.5, CO, NOx, Acetic Acid, DMSO, Nitric Acid, MeOH, F-113, SU, EDC, H2SO4, HCl, MeCl, Initiator, Acetaldehyde, Acroliam, Ammonia, Arsenic, Benzo(a)pyrene, Beryllium metal, Cadmium metal, Chromic acid, Cobalt, Formaldehyde, Hexane, Lead, Manganese, Mercury vapor, Naphthalene, Nickel metal, Selenium compounds, Fluoriform, Total VOC, and HFPO - Dimer Acid.

TOTAL FOCs summary row with totals for each emission category.

FOCs Summary table with columns for 2021 and Proposed values for Process Emissions (lb/yr), Indoor Equipment Emissions (lb/yr), and Outdoor Equipment Emissions (lb/yr).

Pre-Project to Post-Project Difference
-339.27

*Note that Dimer Acid emissions were included in the indoor equipment emission summary above.

