Operating Scenario: OS – 13 **Emission Source/Group ID:** NS–C

10. Operating Schedule: (Source/Operating Scenario that best characterizes Calendar Year 2007)
Hours per Day (24) Days per Week (7) Weeks per Year (52)

11. Typical Start & End Times For Operating Scenario: Start: 0 End: 2359

12. Seasonal Periods Percent Annual Throughput:

Jan–Feb + Dec 2007	25%	March–May 2007	25%	June–Aug. 2007	25%	Sept.–Nov. 2007	25%

13. Actual Emissions per Pollutant Listed :
Attach calculations and documentation of emission factors or other estimation methods used.

GHG Pollutants	CAS	Emissions–GHG Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				

Criteria (NAAQS) Pollutants	Pollutant Code	Emissions–Criteria Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				
CO	CO		08			
NOx	NOx		08			
TSP	TSP		08			
PM10	PM10		08			
PM2.5	PM2.5		08			
SO2	SO2		08			
VOC	VOC	11.8	08	89.6		

HAP/TAP Pollutants (In Alphabetical Order)	CAS (see instructions)	Emissions HAP/TAPS (Pounds/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	EF Control
		2007				
Acetonitrile	75–05–8	187	08	0		
Hydrogen fluoride (hydrofluoric acid as mass of HF–Component of Fluorides)	7664–39–3	1067	08	99.6		

CONFIDENTIAL INFORMATION

Supporting documentation for the determination of air emissions from this emission source contains DuPont Confidential Business Information, which if made public would divulge the manufacturing method, process, and/or capacity, and has therefore been intentionally excluded from the Public Copy of this Air Emissions Inventory as allowed by North Carolina General Statutes §132-1.2, §143-215.3C(a), and §143-215.65.

2007 Emission Summary

Report date 4/3/2008
Prepared by Amy Martin

A. VOC Emissions Summary

Nafion® Compound	CAS Chemical Name	CAS No.	PE/PM Emissions (lbs)	Accidental Releases (lbs)	Total Emissions (lbs)
COF2	Carbonyl Fluoride	353-50-4	1,031	0	1,031
PAF	Perfluoroacetyl Fluoride	354-34-7	1,715	0	1,715
PMPF	Perfluoromethoxypropionyl fluoride	2927-83-5	1,260	0	1,260
PEPF	Perfluoroethoxypropionyl fluoride	1682-78-6	507	0	507
PMVE	Perfluoromethyl vinyl ether	1187-93-5	5,529	2	5,531
PEVE	Perfluoroethyl vinyl ether	10493-43-3	1,722	0	1,722
HFP	Hexafluoropropylene	116-15-4	5,318	0	5,318
HFPO	Hexafluoropropylene Epoxide	428-59-1	5,812	440	6,252
AN	Acetonitrile	75-05-8	187	0	187
HFPO Dimer	Perfluoro-2-Propoxy Propionyl Fluoride	2062-98-8	9	0	9
MD			81	0	81
HydroPEVE			16	0	16
PPVE	Perfluoropropyl vinyl ether	1623-05-8	16	0	16
	Total VOC Emissions (lbs)		**23,205**	**442**	**23,647**
	Total VOC Emissions (tons)		**11.6**	**0.2**	**11.8**

B. VOC Control Device Efficiency

VOCs Generated				VOCs Emitted After Control			
Point Source Generated (lbs)	Equipment Emissions (lbs)		Total VOC Generated (lbs)	Point Source Emissions (lbs)	Equipment Emissions (lbs)		Total VOC Emitted (lbs)
797,932	5,947		803,878	17,258	5,947		23,205

803,878 lb VOC generated
\- 23,205 lb VOC emitted
= 780,674 lb VOC removed in control device

780,674 lb VOC removed in control device
/ 803,878 lb VOC generated
= **97.11%** VOC control device efficiency

C. Toxic Air Pollutant and Hazardous Air Pollutant Summary (TAPS/HAPS)

Nafion® Compound	CAS Chemical Name	CAS No.	PE/PM Emissions (lbs)	Accidental Releases (lbs)	Total Emissions (lbs)
HF	Hydrogen Fluoride	7664-39-3	1,067	0.00	1,067
Acetonitrile	Acetonitrile	75-05-8	187	0.0	187

D. HF Control Device Efficiency

	904	lb HF emitted from Point Sources
/	(100%-99.6%)	Stack Efficiency
=	226,059	lb HF sent to control device from Point Sources

	226,059	lb HF sent to control device from Point Sources
-	1,067	lb HF emitted (all sources)
=	224,992	lb HF removed in control device

	224,992	lb HF removed in control device
/	226,059	lb HF generated
=	**99.53%**	**HF control device efficiency**

E. Overall Emission Control Device Efficiency

	803,878	Total lb VOC generated
+	226,059	Total lb HF generated
=	1,029,938	lb total emissions generated

	780,674	Total lb VOC removed in control device
+	224,992	Total lb HF removed in control device
=	1,005,665	lb total emissions removed in control device

	1,005,665	lb total emissions removed in control device
/	1,029,938	lb total emissions generated
=	**97.64%**	**Overall emission control device efficiency**

2007 AIR EMISSIONS INVENTORY SUPPORTING DOCUMENTATION

Emission Source ID No: NS-C

Emission Source Description: VE-South PEPM Manufacturing Process

Process & Emission Description: The VE-South PEPM manufacturing process is a continuous chemical reaction. All emissions from the process are vented through the VE-South Waste Gas Scrubber (Control Device ID No. NCD-Hdr2) which has a documented control efficiency of 99.6% for all acid fluoride compounds. Some emitted compounds are assumed to pass completely through the scrubber, so the control efficiency for those compounds is assumed to be 0%. The control of emissions of specific compounds will be addressed and detailed in the following pages.

The PEPM process in VE-South emits compounds in the acid fluoride family. In the presence of water (such as in atmospheric moisture), these acid fluorides can eventually hydrolyze to hydrogen fluoride. For the purpose of this emissions inventory, a conservative approach will be taken and the acid fluorides will be reported both as a VOC and as the equivalent quantity of hydrogen fluoride.

Basis and Assumptions:

- A process flowsheet, developed from operating data during a typical month, May 2005, is the basis for relative concentrations of before-control emissions of gaseous wastes.
- The flowsheet is available under the "flowsheet" tab for reference and includes the basis for ratios used in this calculation.
- Because an overall material balance for the year is used for calculation of emissions, "maintenance emissions" related to turnarounds are assumed to be included with the calculated emissions. The usual practice is to deinventory liquids and then vent vessels to the Waste Gas Scrubber.
- All emission determination calculations are available on the EXCEL spreadsheet found at: S:/Everyone/martinas/Emissions/2007/VES 2007 Emissions.xls

J. VOC Summary - All sources

Nafion Compound Name		After Control Stack Emissions		Equipment Emissions (Note 1)		Total Emissions	
		lb/yr VOC	lb/yr HF	lb/yr VOC	lb/yr HF	lb/yr VOC	lb/yr HF
A.	COF2	952	577	79	48	1031	625
B.	PAF	1,638	282	77	13	1715	296
C.	PMPF	398	34	862	73	1260	107
D.	PEPF	147	10	360	25	507	35
E.	PMVE	3,517	0	2012	0	5529	0
F.	PEVE	0	0	1722	0	1722	0
G.	HFP	5,303	0	16	0	5318	0
H.	HFPO	5,303	0	510	0	5812	0
	HFPO Dimer			9	1	9	1
	MD			81	4	81	4
	HydroPEVE			16	0	16	0
	PPVE			16	0	16	0
	AN			187	0	187	0
	Total	**17,258**	**904**	**5,947**	**163**	**23,205**	**1,067**

Note 1 - See section titled "Equipment Emissions" for details

F. Perfluoroethyl vinyl ether (PEVE) **CAS No. 10493-43-3**

HF Potential:

PEVE is a VOC without the potential to form HF.

Quantity Released

There are no point source emissions identified which contain PEVE.

VOC Emissions = **0 kg VOC**
0 lb VOC

G. Hexafluoropropylene (HFP) **CAS No. 116-15-4**

HF Potential:

HFP is a VOC without the potential to form HF.

Quantity Released

HFP is an inert in the process that is vented from the PAF column and from the low boiler column.

HFP in the LBC vent stream is based on the flow sheet and estimated total vented.

The low boiler column vented at a rate of 0.370 kg/h vent rate, (1830FG)

X 8,765 hours of operation (from uptime data)

3,243 kg vented from low boiler column

HFP in the low boiler column vent stream = 9% X 3,243 = 282 kg

The HFP vented from the PAF column is estimated from a material balance on the PAF column.

HFP vented from PAF column = HFP fed to PAF column - HFP left in system (later removed in LBC)

HFP fed to PAF column = 55 kg/h average precursor feed, (1066FC)

X 8765 hours of operation (from uptime data)

X 0.5% typical HFP in precursor feed to PAF column

2,410 kg HFP fed to PAF column

HFP vented from PAF column = 2,410 - 282 = 2,128 kg

After-control emissions from the Waste Gas Scrubber with an assumed efficiency of zero percent (0%)

VOC Emissions

282 kg HFP from PAF Vent
\+ 2,128 kg HFP from LBC Vent
2,410 kg HFP = 2,410 kg VOC
5,303 lb VOC

H. Hexafluoropropylene oxide (HFPO) **CAS No. 428-59-1**

HF Potential:

HFPO is a VOC without the potential to form HF.

Quantity Released

HFPO is an inert in the process that is vented from the PAF column. It is assumed that all HFPO fed to the PAF column is vented.

HFPO fed to PAF column	=	55 kg/h average precursor feed, (1066FC)
	X	8765 hours of operation (from uptime data)
	X	0.5% typical HFPO in precursor feed to PAF column
		2,410 kg HFPO fed to PAF column
	=	2,410 kg HFPO vented from PAF column

After-control emissions from the Waste Gas Scrubber with an assumed efficiency of zero percent (0%)

VOC Emissions

2,410 kg HFPO = 2,410 kg VOC
5,303 lb VOC

I. VOC Summary - Point Source Emissions

	Nafion Compound Name	Before Control VOC Generated		After Control Stack Emissions	
		kg/yr VOC	lb/yr VOC	lb/yr VOC	lb/yr HF
A.	COF2	108,208	238,057	952	577
B.	PAF	186,111	409,445	1,638	282
C.	PMPF	45,235	99,518	398	34
D.	PEPF	16,722	36,789	147	10
E.	PMVE	1,599	3,517	3,517	0
F.	PEVE	0	0	0	0
G.	HFP	2,410	5,303	5,303	0
H.	HFPO	2,410	5,303	5,303	0
	Total	362,696	797,932	**17,258**	**904**

2007 Fugitive Emissions Determination

Fugitive Emissions (FE) are a function of the number of emission points in the plant (valves, flanges, pump seals). For the fugitive emission calculations the inventory shown below is conservative and based on plant and process diagrams.

Note that the division scrubber efficiency is 99.6% for control of acid fluorides.

A. Fugitive Emissions from Condensation Reactor System

Condensation Tower (vents to stack)

Valve emissions:	322 valves x	0.00039 lb/hr/valve	=	0.126 lb/hr VOC from FE
Flange emissions:	644 flanges x	0.00018 lb/hr/flange	=	0.116 lb/hr VOC from FE
Pump emissions:	6 pump x	0.00115 lb/hr/pump	=	0.007 lb/hr VOC from FE
Total fugitive emission rate			=	0.248 lb/hr VOC from FE

Condensation Tower VOC

Total Condensation Fugitive Emissions:

VOC	0.248	lb/hr FE
x	8765	Operating hr/yr
=	2177	lb FE

Composition of Condensation Tower Fugitive Emissions is estimated based on typical process inventory:

PAF column:

Inventoried with	30	gal fluorocarbon
Equivalent mass FC	375.75	lb fluorocarbon

Component	Mass fraction	lb
COF2	0.45	169
PAF	0.54	203
HFP	0.005	2
HFPO	0.005	2

Reactor loop

Inventoried with	51	gal hydrocarbon	assumes 60 gallons, 85% hydrocarbon, 15% fluorocarbon
Equivalent mass HC	383.265	lb hydrocarbon	
Inventoried with	9	gal fluorocarbon	
Equivalent mass FC	112.725	lb fluorocarbon	

Component	Mass fraction	lb	
COF2	0.09	10	
PAF	0.04	5	
HFP	0.03	3	
PMPF	0.59	67	
PEPF	0.23	26	
Dimer	0.01	1	
MD	0.01	1	
AN		383	Hydrocarbon

Reactor decanter

Inventoried with	25	gal hydrocarbon	assumes 50 gal, 50% HC, 50% FC
Equivalent mass HC	187.875	lb hydrocarbon	
Inventoried with	25	gal fluorocarbon	
Equivalent mass FC	313.125	lb fluorocarbon	

Component	Mass fraction	lb	
COF2	0.09	28	
PAF	0.04	13	
HFP	0.03	9	
PMPF	0.59	185	
PEPF	0.23	72	
Dimer	0.01	3	
MD	0.01	3	
AN		188	Hydrocarbon

Stripper column

Inventoried with	30	gal fluorocarbon
Equivalent mass FC	375.75	lb fluorocarbon

Component	Mass fraction	lb
COF2	0.09	34
PAF	0.04	15
HFP	0.03	11
PMPF	0.59	222
PEPF	0.23	86
Dimer	0.01	4
MD	0.01	4

AF column — all FC (70% PMPF, 27% PEPF, 1.5% dimer, 1.5% MD)

Inventoried with	30	gal fluorocarbon
Equivalent mass FC	375.75	lb fluorocarbon

Component	Mass fraction	lb
PMPF	0.7	263
PEPF	0.27	101
Dimer	0.015	6
MD	0.015	6

AF overhead

Inventoried with	1000	kg FC
	2200	lb FC

Component	Mass fraction	lb
PMPF	0.72	1,584
PEPF	0.28	616

AF decanter

Inventoried with	30	gal fluorocarbon
Equivalent mass FC	375.75	lb fluorocarbon

Component	Mass fraction	lb
PMPF	0.72	271
PEPF	0.28	105

HFPO tank

	135	gal HFPO	
	1555.605	lb HFPO	1.38 SG

Waste FC tank

Inventoried with	40	gal fluorocarbon
Equivalent mass FC	501	30% refining waste (?), 70% is condensation waste (4% dimer, 67% MD, 29% ED)

Component	Mass fraction	lb	
Dimer	0.028	14.028	assumes 70% is condensation waste (4% dimer, 67% MD, 29% ED)
MD	0.469	234.969	
ED	0.203	101.703	
PEPF	0.099	49.599	assumes 30% is waste from refining purges, high boilers PEPF,
Hydro PEVE	0.099	49.599	hydro PEVE, and PPVE
PPVE	0.099	49.599	

Average system composition - Condensation

	lb	%	VOC emissions (lb)	Equivalent HF (lb)
COF2	241	3.63%	79	48
PAF	235	3.53%	77	13
HFP	26	0.39%	8	0
HFPO	1,557	23.41%	510	0
PMPF	2,591	38.94%	848	73
PEPF	1,057	15.88%	346	25
Dimer	28	0.42%	9	0.5
MD	249	3.74%	81	4
AN	571	8.58%	187	0
HydroPEV	50	0.75%	16	0
PPVE	50	0.75%	16	0
total	6,653		2177	163

B. Fugitive Emissions from Agitated Bed Reactor System & Refining

Valve emissions:	555 valves x	0.00039	lb/hr/valve	=	0.216 lb/hr FE
Flange emissions:	1110 flanges x	0.00018	lb/hr/flange	=	0.200 lb/hr FE
Pump emissions:	12 pump x	0.00115	lb/hr/pump	=	0.014 lb/hr FE
Total fugitive emission rate				=	0.430 lb/hr FE

ABR & Refining VOC

Total ABR & Refining Fugitive Emissions:

0.43 lb/hr FE
x 8,765 Operating hr/yr
= 3,769 lb FE

ABR/Crude system

Inventoried with 1500 kg FC
3300 lb FC

Component	Mass fraction	lb	
CO2	0.33	1,089	**Not a VOC**
PMPF	0.01	33	
PEPF	0.01	33	
HFP	0.005	17	
PEVE	0.22	726	
PMVE	0.425	1,403	

Refining

Inventoried with 3000 kg FC
6600 lb FC

Component	Mass fraction	lb
PMVE	0.5	3300
PEVE	0.5	3300

Average System Composition - ABR/Refining

	lb	%	VOC emissions (lb)	Equivalent HF (lb)
PMPF	33	0.37%	14	1
PEPF	33	0.37%	14	1
HFP	17	0.19%	7	0
PEVE	4,026	45.69%	1722	0
PMVE	4,703	53.37%	2012	0
total	8,811		3,769	2

C. Acetonitrile fugitive emissions

No normal process vents of AN to stack. Equipment emissions are estimated above for normal process composition and leaks. A material balance is also done to ensure all AN losses are accounted for. When material balance shows negative loss, only the estimated equipment emissions are included.

VOC Emission

AN to hydrocarbon waste from VE-S = total HC waste - VE-N waste= 45,371

Assume that: **5%** of spent acetonitrile are fluorocarbons.

AN portion of hydrocarbon waste stream:

45,371 kg to H/C waste
x (1-(.05))
= 43,102 kg AN to H/C waste

9,245 kg AN fed
- 43,102 kg AN to waste
-33,857 kg AN lost = 0 **kg VOC**
0 lb VOC additional AN loss

Note: Based on this material balance, it is assumed that no AN is emitted to atmosphere from fugitive emissions, other than what is determined above.
The amount of hydrocarbon sent to waste is probably overestimated due to inaccuracies in calculation of VE-N portion of the waste.

D. **Total Fugitive Emissions**

Emission Source	Total Emissions lb VOC
Condensation Tower	1,990
Agitated Bed Reactor & Refining	3,769
AN	187
Total	**5,947**

E. **Speciated Equipment Emissions Summary**

Nafion® Compound	Equipment Emissions	
	lb VOC	lb HF
COF2	79	48
PAF	77	13
HFP	16	0
HFPO	510	0
PMPF	862	73
PEPF	360	25
HFPO Dimer	9	0.5
MD	81	4
HydroPEVE	16	0
PPVE	16	0
PEVE	1,722	0
PMVE	2,012	0
AN	187	0
TOTAL	**5,947**	**163**

2007 Accidental Releases to Atmosphere

A. 2007-133 Date: 10/11/2007 **CAS No. 428-59-1**

Material Released: HFPO
Quantity Released: 200 kg 440.00 lbs HFPO

HF Potential:
HFPO is a VOC without the potential to form HF.

B. 2007-154 Date: 11/16/2007 **CAS No. 1187-93-5**

Material Released: PMVE
Quantity Released: 1 kg 2.20 lbs PMVE

HF Potential:
PMVE is a VOC without the potential to form HF.

B. Total Emissions from Accidental Releases

Summary			lb/yr VOC Total
A.	HFPO		440
B.	PMVE		2
	Total		**440**

2007 Emission Summary

Report date 4/3/2008
Prepared by Amy Martin

A. VOC Emissions Summary

Nafion® Compound	CAS Chemical Name	CAS No.	PE/PM Emissions (lbs)	Accidental Releases (lbs)	Total Emissions (lbs)
COF2	Carbonyl Fluoride	353-50-4	1,031	0	1,031
PAF	Perfluoroacetyl Fluoride	354-34-7	1,715	0	1,715
PMPF	Perfluoromethoxypropionyl fluoride	2927-83-5	1,260	0	1,260
PEPF	Perfluoroethoxypropionyl fluoride	1682-78-6	507	0	507
PMVE	Perfluoromethyl vinyl ether	1187-93-5	5,529	2	5,531
PEVE	Perfluoroethyl vinyl ether	10493-43-3	1,722	0	1,722
HFP	Hexafluoropropylene	116-15-4	5,318	0	5,318
HFPO	Hexafluoropropylene Epoxide	428-59-1	5,812	440	6,252
AN	Acetonitrile	75-05-8	187	0	187
HFPO Dimer	Perfluoro-2-Propoxy Propionyl Fluoride	2062-98-8	9	0	9
MD			81	0	81
HydroPEVE			16	0	16
PPVE	Perfluoropropyl vinyl ether	1623-05-8	16	0	16
	Total VOC Emissions (lbs)		**23,205**	**442**	**23,647**
	Total VOC Emissions (tons)		**11.6**	**0.2**	**11.8**

B. VOC Control Device Efficiency

VOCs Generated				VOCs Emitted After Control			
Point Source Generated (lbs)	Equipment Emissions (lbs)		Total VOC Generated (lbs)	Point Source Emissions (lbs)	Equipment Emissions (lbs)		Total VOC Emitted (lbs)
797,932	5,947		803,878	17,258	5,947		23,205

803,878 lb VOC generated
\- 23,205 lb VOC emitted
= 780,674 lb VOC removed in control device

780,674 lb VOC removed in control device
/ 803,878 lb VOC generated
= **97.11%** VOC control device efficiency

C. Toxic Air Pollutant and Hazardous Air Pollutant Summary (TAPS/HAPS)

Nafion® Compound	CAS Chemical Name	CAS No.	PE/PM Emissions (lbs)	Accidental Releases (lbs)	Total Emissions (lbs)
HF	Hydrogen Fluoride	7664-39-3	1,067	0.00	1,067
Acetonitrile	Acetonitrile	75-05-8	187	0.0	187

D. HF Control Device Efficiency

	904	lb HF emitted from Point Sources
/	(100%-99.6%)	Stack Efficiency
=	226,059	lb HF sent to control device from Point Sources

	226,059	lb HF sent to control device from Point Sources
-	1,067	lb HF emitted (all sources)
=	224,992	lb HF removed in control device

	224,992	lb HF removed in control device
/	226,059	lb HF generated
=	**99.53%**	**HF control device efficiency**

E. Overall Emission Control Device Efficiency

	803,878	Total lb VOC generated
+	226,059	Total lb HF generated
=	1,029,938	lb total emissions generated

	780,674	Total lb VOC removed in control device
+	224,992	Total lb HF removed in control device
=	1,005,665	lb total emissions removed in control device

	1,005,665	lb total emissions removed in control device
/	1,029,938	lb total emissions generated
=	**97.64%**	**Overall emission control device efficiency**

As entered in AERO

Facility Name: DuPont Company – Fayetteville Works
22828 NC Highway 87 West
Fayetteville, NC 28302

Facility ID : 0900009
Permit : 03735
County : Bladen
DAQ Region : FRO

North Carolina Department of Environment and Natural Resources
Division of Air Quality
Air Pollutant Point Source Emissions Inventory – Calendar Year 2007

1. Emission Source ID (from permit) or Emission Source Group ID NS–D

2. Emission Source Description: Nafion RSU Process [MACT FFFF]

3. Operating Scenario ID/Description: OS – 14/Nafion RSU process

4. SCC Number/Description: 30199998/*Other Organic Chemica Manufacture Not Listed

5. Throughput/units in 2007:
(e.g. production or fuel use):

6. Fuel Information (If fuel is used)

% Sulfur		% Ash		Heat Content (Btu/units)	

7. Capture Efficiency
(% of Emissions from this Process Vented to Control Device or Stack): 100

8. Control Device Information :

Order	CS–ID	CD ID (as listed in permit)	Control Device Description
1	CS–6	NCD–Hdr–1	Baffle–plate scrubber (7,000 kilogram/hour liquid injection rate averaged over a 3–hour period)

9. Emission Release Point (ERP) Information: (Sources vented to more than one ERP use additional entry lines):

ERP ID	ERP Type	Height (in feet)	Diameter Circle (enter #): Rectangle (L x W) (in 0.1 feet)	Temperature (F)	Velocity (Feet/sec)	Volume Flow Rate (Acfm)	ERP Description
EP–NEP–Hdr1	VERTICAL STACK	85	3	75	58	24598.67	Nafion scrubber Hdr1

Operating Scenario: OS – 14 **Emission Source/Group ID:** NS–D

10. Operating Schedule: (Source/Operating Scenario that best characterizes Calendar Year 2007)
Hours per Day (24) Days per Week (7) Weeks per Year (52)

11. Typical Start & End Times For Operating Scenario: Start: 0 End: 2359

12. Seasonal Periods Percent Annual Throughput:

Jan–Feb + Dec 2007	21%	March–May 2007	34%	June–Aug. 2007	28%	Sept.–Nov. 2007	17%

13. Actual Emissions per Pollutant Listed :
Attach calculations and documentation of emission factors or other estimation methods used.

GHG Pollutants	CAS	Emissions–GHG Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				

Criteria (NAAQS) Pollutants	Pollutant Code	Emissions–Criteria Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				
CO	CO		08			
NOx	NOx		08			
TSP	TSP	0.12	08			
PM10	PM10		08			
PM2.5	PM2.5		08			
SO2	SO2	5.79	08	99.6		
VOC	VOC	2.14	08	99.6		

HAP/TAP Pollutants (In Alphabetical Order)	CAS (see instructions)	Emissions HAP/TAPS (Pounds/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	EF Control
		2007				
Hydrogen fluoride (hydrofluoric acid as mass of HF–Component of Fluorides)	7664–39–3	49.15	02	99.6		
Sulfuric acid	7664–93–9	231.5	02	99.6		

CONFIDENTIAL INFORMATION

Supporting documentation for the determination of air emissions from this emission source contains DuPont Confidential Business Information, which if made public would divulge the manufacturing method, process, and/or capacity, and has therefore been intentionally excluded from the Public Copy of this Air Emissions Inventory as allowed by North Carolina General Statutes §132-1.2, §143-215.3C(a), and §143-215.65.

Fugitive and Equipment Emissions Determination (Non-point Source):

Fugitive (FE) and Equipment Emissions (EE) are a function of the number of emission points in the plant (valves, flanges, pump seals). The inventory shown below is conservative and based on plant and process diagrams. Note that the calculations below include equipment emissions inside as well as equipment emissions outside (fugitive emissions).

A. Equipment emissions from SU Reactor, Rearranger, RSU Still and RSU Hold Tank:

Emissions are vented from equipment located inside the RSU barricade and are vented to a vent

Barricade:

Valve emissions:	250 valves x 0.00036 lb/hr/valve	=	0.090 lb/hr EE
Flange emissions:	550 flanges x 0.00018 lb/hr/flang	=	0.045 lb/hr EE
Total equipment emission rate		=	0.135 lb/hr EE

Days of operation = 117

On average 0.13 lbs of HF are produced for every 1 lb of RSU, SU or PAF.

VOC:		**HF:**	
	0.135 lb/hr EE		0.135 lb/hr EE
x	24 hours/day	x	24 hours/day
x	117 days/year	x	117 days/year
=	**378.1 lb/yr VOC from EE**	x	0.13 lb HF per lb VOC
		=	**49.1 lb/yr HF from EE**

B. Fugitive Emissions From SO3 Storage Tank and Vaporizer

This equipment is not inside a building, therefore emissions are true Fugitive Emissions

Valve emissions:	85 valves x 0.00036 lb/hr/valve	=	0.031 lb/hr FE
Flange emissions:	180 flanges x 0.00018 lb/hr/flang	=	0.032 lb/hr FE
Total fugitive emission rate		=	0.063 lb/hr FE

SO3:		**H2SO4:**	
	0.063 lb. FE/hr		0.063 lb. FE/hr
x	24 hours/day	x	24 hours/day
x	117 days/year	x	117 days/year
=	**176.9 lb/yr SO3 from EE**	x	1.225 lb H2SO4 per lb SO3
		=	**216.7 lb/yr H2SO4 from FE**

C. Fugitive Emissions From EDC Tank

This equipment is not inside a building, therefore emissions are true Fugitive Emissions

Valve emissions:	20 valves x 0.00036 lb/hr/valve	=	0.007 lb/hr FE
Flange emissions:	10 flanges x 0.00018 lb/hr/flange	=	0.002 lb/hr FE
Total fugitive emission rate		=	0.009 lb/hr FE

VOC:		HF:	
	0.009 lb/hr FE		0
x	24 hours/day		
x	117 days/year		
=	**25.3 lb/yr VOC from FE**		

D. Total RSU Plant Non-Point Source Emissions

	Equipment Emissions		Fugitive Emissions		
Emission Source	VOC lb/yr	HF lb/yr	VOC lb/yr	SO3 lb/yr	H2SO4 lb/yr
A. Equipment Emissions from SU Reactor, Rearranger, Still and Hold Tank	378.1	49.1	0	0	0
B. Fugitive Emissions From SO3 Storage Tank and Vaporizer	0	0	0	176.9	216.7
C. Fugitive Emissions From EDC Tank	0	0	25.3	0	0
Total for 2007	**378.1**	**49.1**	**25.3**	**176.9**	**216.7**

E. VOC Emission by Source Type

Nafion® Compound	Emissions from Stack (lb)	Equipment Emissions (lb)	Fugitive Emissions (lb)	Accidental Releases (lb)	Total Emissions (lb)
TFE	3856.0	375.6	0	0	4231.6
PAF	10.7	1.0	0	0	11.7
RSU	3.6	0.4	0	462.0	466.0
SU	10.7	1.0	0	0	11.7
EDC	0	0	25.3	0	25.3
Total	**3880.9**	**378.1**	**25.3**	**462.0**	**4746.2**

Note: Speciated equipment emissions were estimated by assuming that each compound's equipment emission concentration was equal to that compound's stack emission fraction of the total stack emission.

Example: The TFE equipment emissions were determined by the ratio of the TFE stack emission (1,997.9 lb) divided by the total stack emission (2,010.8 lb), multiplied by the total equipment emissions (229.4 lb).

Specifically: $\frac{3856.0}{3880.9} \times 378.1 = 375.6$ lb. TFE

Emission Summary

A. VOC Emissions by Compound and Source

Nafion® Compound	CAS Chemical Name	CAS No.	Point Source Emissions	Fugitive Emissions (lbs)	Equipment Emissions (lbs)	Accidental Emissions (lbs)	Total VOC Emissions (lbs)
TFE	Tetrafluoroethylene	116-14-3	3856.0	0	375.6	0	4231.6
PAF	Trifluoroacetyl Fluoride	354-34-7	10.7	0	1.0	0	11.7
RSU	Difluoro(Fluorosulfonyl)Acetyl Fluoride	677-67-8	3.6	0	0.4	0.0	4.0
SU	2-Hydroxytetrafluoroethane Sulfonic Acid Sultone	697-18-7	10.7	0	1.0	0	11.7
EDC	1,2-Dichloroethane	107-06-2	0	25.3	0	0	25.3
Total for 2007			**3880.9**	**25.3**	**378.1**	**0.0**	**4284.2**
						Tons	**2.14**

B. Toxic Air Pollutant Summary

Nafion® Compound	CAS Chemical Name	CAS No.	Point Source Emissions	Fugitive Emissions (lbs)	Equipment Emissions (lbs)	Accidental Emissions (lbs)	Total TAP Emissions (lbs)
HF	Hydrogen Fluoride	7664-39-3	3.42	0	49.1	0.0	**49.15**
H2SO4	Sulfuric Acid	7664-93-9	14.8	216.7	0	0	**231.5**

C. Criteria Air Pollutant Summary

Nafion® Compound	CAS Chemical Name	CAS No.	Point Source Emissions	Fugitive Emissions (lbs)	Equipment Emissions (lbs)	Accidental Emissions (lbs)	Total VOC Emissions (lbs)
SO2	Sulfur dioxide	7446-09-5	5.8	0	0	0	**5.8**

As entered in AERO

Facility Name: DuPont Company – Fayetteville Works
22828 NC Highway 87 West
Fayetteville, NC 28302

Facility ID : 0900009
Permit : 03735
County : Bladen
DAQ Region : FRO

North Carolina Department of Environment and Natural Resources
Division of Air Quality
Air Pollutant Point Source Emissions Inventory – Calendar Year 2007

1. Emission Source ID (from permit) or Emission Source Group ID NS–E

2. Emission Source Description: Nafion Liquid waste stabilization [MACT FFFF]

3. Operating Scenario ID/Description: OS – 15/Nafion liquid waste stabilization

4. SCC Number/Description: 30199998/*Other Organic Chemica Manufacture Not Listed

5. Throughput/units in 2007: (e.g. production or fuel use): 2298994 LB/yr

6. Fuel Information (If fuel is used)

% Sulfur		% Ash		Heat Content (Btu/units)	

7. Capture Efficiency (% of Emissions from this Process Vented to Control Device or Stack): 100

8. Control Device Information :

Order	CS–ID	CD ID (as listed in permit)	Control Device Description
1	CS–6	NCD–Hdr–1	Baffle–plate scrubber (7,000 kilogram/hour liquid injection rate averaged over a 3–hour period)

9. Emission Release Point (ERP) Information: (Sources vented to more than one ERP use additional entry lines):

ERP ID	ERP Type	Height (in feet)	Diameter Circle (enter #): Rectangle (L x W) (in 0.1 feet)	Temperature (F)	Velocity (Feet/sec)	Volume Flow Rate (Acfm)	ERP Description
EP–NEP–Hdr1	VERTICAL STACK	85	3	75	58	24598.67	Nafion scrubber Hdr1

Operating Scenario: OS – 15 **Emission Source/Group ID:** NS–E

10. Operating Schedule: (Source/Operating Scenario that best characterizes Calendar Year 2007)
Hours per Day (24) Days per Week (7) Weeks per Year (52)

11. Typical Start & End Times For Operating Scenario: Start: 0 End: 2359

12. Seasonal Periods Percent Annual Throughput:

Jan–Feb + Dec 2007	25%	March–May 2007	25%	June–Aug. 2007	25%	Sept.–Nov. 2007	25%

13. Actual Emissions per Pollutant Listed :
Attach calculations and documentation of emission factors or other estimation methods used.

GHG Pollutants	CAS	Emissions–GHG Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				

Criteria (NAAQS) Pollutants	Pollutant Code	Emissions–Criteria Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				
CO	CO		08			
NOx	NOx		08			
TSP	TSP		08			
PM10	PM10		08			
PM2.5	PM2.5		08			
SO2	SO2		08			
VOC	VOC	0.28	08	99.6		

HAP/TAP Pollutants (In Alphabetical Order)	CAS (see instructions)	Emissions HAP/TAPS (Pounds/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	EF Control
		2007				
Hydrogen fluoride (hydrofluoric acid as mass of HF–Component of Fluorides)	7664–39–3	125.5	02	99.6		

2007 AIR EMISSIONS INVENTORY SUPPORTING DOCUMENTATION

Emission Source ID No.: NS-E

Emission Source Description: Nafion Liquid Waste Stabilization

Process & Emission Description:

The Nafion liquid waste stabilization is a continuous system of storage with batch neutralization. To comply with the regulatory requirements of RCRA SubPart CC, neither the storage tank nor the reactor vent during normal operating conditions. All venting from this system occurs as a non-routine maintenance activity, which is detailed in the following pages. All emissions from this system are vented through the Nafion Division Waste Gas Scrubber (Control Device ID No. NCD-Hdr1) which has a documented control efficiency of 99.6% for acid fluoride compounds. The control of emissions of specific compounds will be addressed and detailed in the following pages.

The Nafion liquid waste stabilization process emits compounds in the acid fluoride family. In the presence of water, these acid fluorides will eventually hydrolyse to hydrogen fluoride. For the purpose of this emissions inventory, a conservative approach will be take and the acid fluorides will be reported both as a VOC and as the equivalent quantity of hydrogen fluoride.

Basis and Assumptions:

- For the HF emissions the entire gas flow is assumed to be HF
- The VOC emissions are assumed to be 30% COF2 and 70% TAF
- The reactor and storage tank are assumed to have the same concentration.
- The ideal gas law is used.

Information Inputs and Source Inputs:

Information Input	Source of Inputs
Weight of Tank	IP21 (H3450WG and H3606WG)
Category and Reason for Emission	Waste Mechanical Facilitator

Point Source Emissions Determination:

Shown on the following pages

Fugitive Emissions Determination:

Shown on the following pages.

Stack Emissions from Maintenance Activity or Emergency Activity

Background

Before performing maintenance on the reactor or storage tank, the pressure from the system is vented to the Division WGS. Each vent is recorded in IP21 by the weight before and after the vent. There can be times when the pressure in either the reactor or storage tank rises rapidly due to reaction. During these times if the pressure rises above 700 kpa in either tank, a pressure control valve can be opened to vent the tank to avoid the relief valve opening. See chart below.

Date	Tank	Category	Reason	Tank Weight	
				Initial (kg)	Final (kg)
10/20/07	Storage Tank	Maintenance	Shutdown work	285	200
10/21/07	Reactor	Maintenance	Shutdown work	3740	3641
11/27/07	Storage Tank	Emergency	Pressure spike	688	674

Sample calculation using maintenance activity dated 10/20/07

Initial Weight	minus	Final Weight	equals	kg vented to Division WGS
285 kg	minus	200 kg	equals	85 kg vented to WGS

Assume that all of the above is VOC emissions This assumption also overstates the true emissions as inerts, such as nitrogen are not counted.

After-control emissions utilizing the 99.6% control efficient Waste Gas Scrubber (WGS):

Percentage of acid fluoride VOCs removed by the WGS = 99.6%
Percentage of acid fluoride VOCs vented from the WGS = 100% minus 99.6%
Percentage of acid fluoride VOCs vented from the WGS = 0.4%

Therefore, VOCs vented to the atmosphere from the ###### maintenance activity is equal to:

Amount of VOCs vented to WGS: 85 kg of VOC
Percentage of VOCs vented from the WGS: x 0.4%
Quantity of VOCs vented from the WGS: = 0.34 kg VOC
= **0.7496 lb VOC**

Stack Emissions from Maintenance Activity (cont.)

VOC Emissions by Compound

Assume that the vapor is 30% COF2 and 70% TAF. This assumption is based on process knowledge of the system.

Quantity of VOCs vented from the WGS (see previous page) = **0.7496 lb VOC**

COF2 (carbonyl fluoride) **CAS No. 353-50-4**

Sample calculation using maintenance activity dated 10/20/07

VOC emissions would be equal to:

$$\frac{0.750 \text{ lb VOC}}{} \left| \frac{0.30 \text{ lb COF2}}{\text{lb VOC}} \right. = 0.2249 \text{ lb COF2}$$

TAF (telomeric acid fluoride) **CAS No. 690-43-7**
(perfluoro-3,5,7, 9,11-pentaoxadodecanoyl fluoride)

Sample calculation using maintenance activity dated 10/20/07

VOC emissions would be equal to:

$$\frac{0.750 \text{ lb VOC}}{} \left| \frac{0.70 \text{ lb TAF}}{\text{lb VOC}} \right. = 0.5247 \text{ lb VOC}$$

Stack Emissions from Maintenance Activity (cont.)

HF Potential

Assume that the vapor is 30% COF2 and 70% TAF. This assumption is based on process knowledge of the system.

COF2 (carbonyl fluoride) **CAS No. 353-50-4**

Each mole of COF2 (MW = 66) can generate 2 moles of HF (MW =20)

$$\frac{1 \text{ lb COF2}}{} \left| \frac{1 \text{ mole COF2}}{66 \text{ lb COF2}} \right| \frac{20 \text{ lb HF}}{\text{mole HF}} \left| \frac{2 \text{ moles HF}}{1 \text{ mole COF2}} \right. = 0.606 \text{ lb of HF}$$

Therefore, each 1 lb of COF2 generates 0.606 lb of HF

TAF (telomeric acid fluoride) **CAS No. 690-43-7**
(perfluoro-3,5,7, 9,11-pentaoxadodecanoyl fluoride)

Each mole of TAF (MW = 330) can generate 1 mole of HF (MW =20)

$$\frac{1 \text{ lb TAF}}{} \left| \frac{1 \text{ mole TAF}}{330 \text{ lb TAF}} \right| \frac{20 \text{ lb HF}}{\text{mole HF}} \left| \frac{1 \text{ moles HF}}{1 \text{ mole TAF}} \right. = 0.061 \text{ lb of HF}$$

Therefore, each 1 lb of TAF generates 0.061 lb of HF

Sample calculation using maintenance activity dated 10/20/07

Quantity of VOCs vented from the WGS (see Page 2) = **0.7496 lb VOC**

HF equivalent emissions would be equal to:

$$\frac{0.750 \text{ lb VOC}}{} \left| \frac{0.30 \text{ lb COF2}}{\text{lb VOC}} \right| \frac{0.606 \text{ lb HF}}{\text{lb COF2}} = 0.1363 \text{ lb HF}$$

$$\frac{0.750 \text{ lb VOC}}{} \left| \frac{0.70 \text{ lb TAF}}{\text{lb VOC}} \right| \frac{0.061 \text{ lb HF}}{\text{lb TAF}} = 0.0318 \text{ lb HF}$$

Therefore, HF vented to the atmosphere from the ###### maintenance activity is equal to:

0.1363 lb HF + 0.0318 lb HF = 0.1681 lb HF

Stack Emissions from Maintenance Activity (cont.)

Calculation page

Date	Tank	Category	Reason	Weight of Tank		Emitted VOC (lb)	Emitted HF (lb)
				Initial (kg)	Final (kg)		
10/20/07	Storage Tank	Maintenance	Shutdown work	285	200	0.750	0.168
10/21/07	Reactor	Maintenance	Shutdown work	3740	3641	0.873	0.196
11/27/07	Storage Tank	Emergency	Pressure spike	688	674	0.123	0.028

Total Emissions	1.75	0.39

Total VOC = 1.75 lb

VOC = 0.0009 ton STACK EMISSIONS

Total HF = 0.39 lb STACK EMISSIONS

Speciated VOC Stack Emissions

The VOC emissions from the Waste Liquid Stabilization process is assumed to be comprised of 30% by weight of COF2 and 70% by weight of TAF. The emission of these compounds from each of the following events is determined simply by multiplying the total emitted VOC by 30% to determine the COF2 emission and 70% to determine the TAF emission.

Date	Tank	Category	Reason	Emitted VOC (lb)	Emitted COF2 (lb)	Emitted TAF (lb)
10/20/07	Storage Tank	Maintenance	Shutdown work	0.750	0.225	0.525
10/21/07	Reactor	Maintenance	Shutdown work	0.873	0.262	0.611
11/27/07	Storage Tank	Emergency	Pressure spike	0.123	0.037	0.086

Total Emissions	1.75	0.52	1.22

Fugitive Emissions Leak Rates for Process Equipment

Using the following table, the Fugitive Emissions Rates will be calculated:

Component	Service	Emission Factors (lb/hr/component)
Pump Seals	Light Liquid	0.00115
Valves	Light Liquid	0.00036
Flanges	All	0.00018

VOC Fugitive Emissions from Equipment Components

2	Pump Seals	x	0.00115	lb/hr/pumpseal	=	0.0023	lb/hr VOC
148	Valves	x	0.00036	lb/hr/valve	=	0.0533	lb/hr VOC
45	Flanges	x	0.00018	lb/hr/flange	=	0.0081	lb/hr VOC
	Total VOC Emissions from Equipment Leaks				=	0.0637	lb/hr VOC

Total Annual Fugitive VOC Emissions:

0.0637 lb/hr VOC x 8760 hr/year = 557.84 lb VOC for 2005
0.2789 tons VOC

Speciated Fugitive VOC Emissions by Compound:

Assume that the emissions are 30% COF2 and 70% TAF. This assumption is based on process knowledge of the system.

$$\frac{557.8 \text{ lb VOC}}{} \left| \frac{0.30 \text{ lb COF2}}{\text{lb VOC}} \right. = \mathbf{167.35 \text{ lb COF2}}$$

$$\frac{557.8 \text{ lb VOC}}{} \left| \frac{0.70 \text{ lb TAF}}{\text{lb VOC}} \right. = \mathbf{390.49 \text{ lb TAF}}$$

See Page 3 for HF equivalents calculation:

$$\frac{557.8 \text{ lb VOC}}{} \left| \frac{0.30 \text{ lb COF2}}{\text{lb VOC}} \right| \frac{0.606 \text{ lb HF}}{\text{lb COF2}} = 101.42 \text{ lb HF}$$

$$\frac{557.8 \text{ lb VOC}}{} \left| \frac{0.70 \text{ lb TAF}}{\text{lb VOC}} \right| \frac{0.061 \text{ lb HF}}{\text{lb TAF}} = 23.666 \text{ lb HF}$$

101.42 lb HF + 23.666 lb HF = **125.1 lb HF**

Emission Summary

A. VOC Emissions by Compound and Source

Nafion® Compound	CAS Chemical Name	CAS No.	Stack Emissions (lbs)	Fugitive Emissions (lbs)	Total Emissions (lbs)
COF2	Carbonyl fluoride	116-14-3	0.52	167.4	167.9
TAF	Perfluoro-3,5,7, 9,11-pentaoxadodecanoyl fluoride	690-43-7	1.22	390.5	391.7
			Total VOC (lb)		**559.6**
			Total VOC (ton)		**0.28**

B. Toxic Air Pollutant Summary

Nafion® Compound	CAS Chemical Name	CAS No.	Stack Emissions (lbs)	Fugitive Emissions (lbs)	Total Emissions (lbs)
HF	Hydrogen fluoride	7664-39-3	0.39	125.1	125.5

As entered in AERO

Facility Name: DuPont Company – Fayetteville Works
22828 NC Highway 87 West
Fayetteville, NC 28302

Facility ID : 0900009
Permit : 03735
County : Bladen
DAQ Region : FRO

North Carolina Department of Environment and Natural Resources
Division of Air Quality
Air Pollutant Point Source Emissions Inventory – Calendar Year 2007

1. Emission Source ID (from permit) or Emission Source Group ID NS–F

2. Emission Source Description: Nafion MMF process [MACT FFFF]

3. Operating Scenario ID/Description: OS – 16/Nafion MMF process

4. SCC Number/Description: 30199998/*Other Organic Chemica Manufacture Not Listed

5. Throughput/units in 2007:
(e.g. production or fuel use):

6. Fuel Information (If fuel is used)

% Sulfur		% Ash		Heat Content (Btu/units)	

7. Capture Efficiency
(% of Emissions from this Process Vented to Control Device or Stack): 100

8. Control Device Information :

Order	CS–ID	CD ID (as listed in permit)	Control Device Description
1	CS–6	NCD–Hdr–1	Baffle–plate scrubber (7,000 kilogram/hour liquid injection rate averaged over a 3–hour period)

9. Emission Release Point (ERP) Information: (Sources vented to more than one ERP use additional entry lines):

ERP ID	ERP Type	Height (in feet)	Diameter Circle (enter #): Rectangle (L x W) (in 0.1 feet)	Temperature (F)	Velocity (Feet/sec)	Volume Flow Rate (Acfm)	ERP Description
EP–NEP–Hdr1	VERTICAL STACK	85	3	75	58	24598.67	Nafion scrubber Hdr1

Operating Scenario: OS – 16 **Emission Source/Group ID:** NS–F

10. Operating Schedule: (Source/Operating Scenario that best characterizes Calendar Year 2007)
Hours per Day (24) Days per Week (7) Weeks per Year (52)

11. Typical Start & End Times For Operating Scenario: Start: 0 End: 2359

12. Seasonal Periods Percent Annual Throughput:

Jan–Feb + Dec 2007	19%	March–May 2007	6%	June–Aug. 2007	53%	Sept.–Nov. 2007	22%

13. Actual Emissions per Pollutant Listed :
Attach calculations and documentation of emission factors or other estimation methods used.

GHG Pollutants	CAS	Emissions–GHG Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				

Criteria (NAAQS) Pollutants	Pollutant Code	Emissions–Criteria Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				
CO	CO		08			
NOx	NOx		08			
TSP	TSP		08			
PM10	PM10		08			
PM2.5	PM2.5		08			
SO2	SO2		08			
VOC	VOC	0.67	08	99.6		

HAP/TAP Pollutants (In Alphabetical Order)	CAS (see instructions)	Emissions HAP/TAPS (Pounds/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	EF Control
		2007				
Hydrogen fluoride (hydrofluoric acid as mass of HF–Component of Fluorides)	7664–39–3	74.9	02	99.6		

CONFIDENTIAL INFORMATION

Supporting documentation for the determination of air emissions from this emission source contains DuPont Confidential Business Information, which if made public would divulge the manufacturing method, process, and/or capacity, and has therefore been intentionally excluded from the Public Copy of this Air Emissions Inventory as allowed by North Carolina General Statutes §132-1.2, §143-215.3C(a), and §143-215.65.

2007 Air Emissions Inventory Supporting Documentation

Emission Source ID No.: NS-F

Emission Source Description: Nafion MMF Process

Process and Emission Description:

The MMF process is a batch/semi-batch manufacturing process. All emissions from this process vent to the Nafion Division Waste Gas Scrubber (WGS), Control Device ID No. NCD-Hdr1, which has a documented efficiency of 99.6%. The control of emissions of certain compounds will be addressed in the following spreadsheets. Some compounds (i.e. TFE) pass completely through the scrubber, therefore the efficiency is assumed to be zero percent (0%).

Basis and Assumptions:

The MMF process flowsheets #9599 and #5600 are used as a basis for relative compositions and flow rates of vent streams to the division WGS.

Information Inputs and Source of Inputs:

Information Input	Source of Inputs
MMF production quantity	MMF Production Facilitator
Speciated emission rates	MMF Process Flowsheets

Point Source Emissions Determination:

Point source emissions for individual components are given in the following pages. A detailed explanation of the calculations are attached.

Equipment Emissions and Fugitive Emissions Determination:

Emissions from equipment leaks which vent as stack (point source) emissions and true fugitive (non-point source) emissions have been determined using equipment component emission factors established by DuPont. The determination of those emissions are shown in a seperate section of this supporting documentation.

Fugitive and Equipment Emissions Determination (Non-point Source):

Fugitive (FE) and Equipment Emissions (EE) are a function of the number of emission points in the plant (valves, flanges, pump seals). The inventory shown below is conservative and based on plant and process diagrams. Note that the calculations below include the following: (1) equipment emissions emissions not inside buildings, which are "fugitive" in nature and will be reported as such, and (2) equipment emissiion in side buildings, which are not "fugitive" in nature and will be reported as equipment emissions only.

A. Fugitive emissions from MMF equipment outside of the barricade:

Emissions from this equipment are not inside a building and are therefore "fugitive" in nature.

Valve emissions:	552 valves x 0.00036 lb/hr/valve	=	0.199 lb/hr EE
Flange emissions:	100 flanges x 0.00018 lb/hr/flange	=	0.018 lb/hr EE
Total equipment emission rate		=	0.217 lb/hr EE

Days of operation = 96

On average 0.13 lbs of HF are produced for every 1 pound of process material released

VOC:		**HF:**	
	0.217 lb/hr EE		0.217 lb/hr EE
x	24 hours/day	x	24 hours/day
x	96 days/year	x	96 days/year
=	**499.3 lb/yr VOC from EE**	x	0.13 lb HF per lb VOC
		=	**64.9 lb/yr HF from EE**

B. Equipment Emissions From MMF Reactor and Transfer Tank

This equipment is inside a building, therefore emissions are not true Fugitive Emissions

Valve emissions:	88 valves x 0.00036 lb/hr/valve	=	0.032 lb/hr FE
Flange emissions:	10 flanges x 0.00018 lb/hr/flange	=	0.002 lb/hr FE
Total fugitive emission rate		=	0.033 lb/hr FE

VOC:		**HF:**	
	0.033 lb. FE/hr		0.033 lb. FE/hr
x	24 hours/day	x	24 hours/day
x	96 days/year	x	96 days/year
=	**77.1 lb/yr VOC from EE**	x	0.13 lb HF per lb VOC
		=	**10.0 lb/yr HF from EE**

C. Total MMF Plant Non-Point Source Emissions

Emission Source	Fugitive Emissions		Equipment Emissions	
	VOC lb/yr	HF lb/yr	VOC lb/yr	HF lb/yr
A. Fugitive emissions from MMF equipment outside of the barricade:	499.3	64.9	0	0
B. Equipment Emissions From MMF Reactor and Transfer Tank	0	0	77.1	10.0
Total for 2007	**499.3**	**64.9**	**77.1**	**10.0**

E. VOC Emission by Source Type

Nafion® Compound	Emissions from Stack (lb)	Fugitive Emissions (lb)	Equipment Emissions (lb)	Accidental Releases (lb)	Total Emissions (lb)
DMC	630.6	414.7	0	0	1045.3
DME	0.2	0.1	0	0	0.3
MTVE	0.04	0.02	0	0	0.06
MTFE	0.05	0.03	0	0	0.08
MTP	0.04	0.03	0	0	0.07
BMTK	0.004	0.002	0	0	0.006
MTP Acid	0.0012	0.001	0	0	0.002
TFE	96.3	63.3	0	0	159.6
CH3F	32.1	21.1	17.0	0	70.2
MMF	0	0	60.2	0	60.2
Total	**759.3**	**499.3**	**77.1**	**0.0**	**1335.8**

Note: Speciated equipment emissions were estimated by assuming that each compound's equipment emission concentration was equal to that compound's stack emission fraction of the total stack emission.

Example: The DMC equipment emissions were determined by the ratio of the DMC stack emission (254.7 lb) divided by the total stack emission (306.7 lb), multiplied by the total equipment emissions (358.9 lb).

Specifically: $\frac{630.6}{759.3} \times 499.3 = 414.7$ lb. DMC

Emission Summary

A. VOC Emissions by Compound and Source

Nafion® Compound	CAS Chemical Name	CAS No.	Point Source Emissions (lbs)	Fugitive Emissions (lbs)	Equipment Emissions (lbs)	Accidental Emissions (lbs)	Total VOC Emissions (lbs)
DMC	Carbonic Acid, Dimethy Ester	616-38-6	630.6	414.7	0	0	1,045.3
DME	Dimethyl ether	115-10-6	0.2	0.1	0	0	0.3
MTVE	Methyl Trifluorovinyl Ether	3823-94-7	0.04	0.02	0	0	0.1
MTFE	1-methoxy-1,1,2,2-tetrafluoroethane	425-88-7	0.05	0.03	0	0	0.1
MTP	Methyl-3-methoxy-	755-73-7	0.04	0.03	0	0	0.1
BMTK	Bis(2-methoxytetrafluoroethyl)ketone	1422-71-5	0.00	0.002	0	0	0.0
MTP Acid	MTP Acid	93449-21-9	0.00	0.001	0	0	0.0
TFE	Tetrafluoroethylene	116-14-3	96.3	63.3	0	0	159.6
CH3F	Methyl Fluoride	593-53-3	32.1	21.1	17.0	0	70.2
MMF	Propanoic Acid, 2,2,3-Trifluoro-3-oxo,methyl ester	69116-71-8	0	0.0	60.2	0	60.2
Total VOC for 2007			**759.3**	**499.3**	**77.1**	**0**	**1,335.8**
						VOC (Tons)	**0.67**

B. Toxic Air Polluntant Summary

Nafion® Compound	CAS Chemical Name	CAS No.	Point Source Emissions (lbs)	Fugitive Emissions (lbs)	Equipment Emissions (lbs)	Accidental Emissions (lbs)	Total Emissions (lbs)
HF	Hydrogen Fluoride	7664-39-3	0	64.9	10	0	74.9

As entered in AERO

Facility Name: DuPont Company – Fayetteville Works
22828 NC Highway 87 West
Fayetteville, NC 28302

Facility ID : 0900009
Permit : 03735
County : Bladen
DAQ Region : FRO

North Carolina Department of Environment and Natural Resources
Division of Air Quality
Air Pollutant Point Source Emissions Inventory – Calendar Year 2007

1. Emission Source ID (from permit) or Emission Source Group ID NS–G

2. Emission Source Description: Nafion Resins process [MACT FFFF]

3. Operating Scenario ID/Description: OS – 17/Nafion SR/CR resin process

4. SCC Number/Description: 30199998/*Other Organic Chemica Manufacture Not Listed

5. Throughput/units in 2007:
(e.g. production or fuel use):

6. Fuel Information (If fuel is used)

% Sulfur		% Ash		Heat Content (Btu/units)	

7. Capture Efficiency
(% of Emissions from this Process Vented to Control Device or Stack):

8. Control Device Information :None

Order	CS–ID	CD ID (as listed in permit)	Control Device Description

9. Emission Release Point (ERP) Information: (Sources vented to more than one ERP use additional entry lines):

ERP ID	ERP Type	Height (in feet)	Diameter Circle (enter #): Rectangle (L x W) (in 0.1 feet)	Temperature (F)	Velocity (Feet/sec)	Volume Flow Rate (Acfm)	ERP Description
EP–NEP–G	VERTICAL STACK	70	2.2	75	54	12316.29	SR/CR resin process

Operating Scenario: OS – 17 **Emission Source/Group ID:** NS–G

10. Operating Schedule: (Source/Operating Scenario that best characterizes Calendar Year 2007)
Hours per Day (24) Days per Week (7) Weeks per Year (52)

11. Typical Start & End Times For Operating Scenario: Start: 0 End: 2359

12. Seasonal Periods Percent Annual Throughput:

Jan–Feb + Dec 2007	25%	March–May 2007	25%	June–Aug. 2007	25%	Sept.–Nov. 2007	25%

13. Actual Emissions per Pollutant Listed :
Attach calculations and documentation of emission factors or other estimation methods used.

GHG Pollutants	CAS	Emissions–GHG Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				

Criteria (NAAQS) Pollutants	Pollutant Code	Emissions–Criteria Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				
CO	CO		08			
NOx	NOx		08			
TSP	TSP		08			
PM10	PM10		08			
PM2.5	PM2.5		08			
SO2	SO2		08			
VOC	VOC	29.6	02			

HAP/TAP Pollutants (In Alphabetical Order)	CAS (see instructions)	Emissions HAP/TAPS (Pounds/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	EF Control
		2007				
Hydrogen fluoride (hydrofluoric acid as mass of HF–Component of Fluorides)	7664–39–3	0.5	02			
Methanol	67–56–1	340	02			

CONFIDENTIAL INFORMATION

Supporting documentation for the determination of air emissions from this emission source contains DuPont Confidential Business Information, which if made public would divulge the manufacturing method, process, and/or capacity, and has therefore been intentionally excluded from the Public Copy of this Air Emissions Inventory as allowed by North Carolina General Statutes §132-1.2, §143-215.3C(a), and §143-215.65.

Yearly Emission Summary

A. VOC Compound Summary

NS-G SR/CR Resins Manufacturing Process			
Nafion® Compound	**CAS Chemical Name**	**CAS No.**	**Emission (lbs)**
PSEPVE	Perfluoro-2-(2-Fluorosulfonylethoxy) Propyl Vinyl Ether	16090-14-5	4,826
EVE	Propanoic Acid, 3-[1-[Difluoro[(Trifluoroethenyl)oxy]Methyl]-1,2,2,2-Tetrafluoroethoxy]-2,2,3,3-Tetrafluoro-Methyl Ester	63863-43-4	-1,117
TFE	Tetrafluoroethylene	116-14-3	54,502
E-2	2H-Perfluoro(5-Methyl-3,6-Dioxanonane)	3330-14-1	970
		Total VOC Emissions (lbs)	**59,181**
		Total VOC Emissions (tons)	**29.6**

B. Toxic Air Pollutant Summary

NS-G SR/CR Resins Manufacturing Process			
Nafion® Compound	**CAS Chemical Name**	**CAS No.**	**Emission (lbs)**
F-113	Trichloro-1,2,2-trifluoro-1,1,2 Ethane	76-13-1	0
HF	Hydrogen Fluoride	7664-39-3	0.5
MeOH	Methanol	67-56-1	340

As entered in AERO

Facility Name: DuPont Company – Fayetteville Works
22828 NC Highway 87 West
Fayetteville, NC 28302

Facility ID : 0900009
Permit : 03735
County : Bladen
DAQ Region : FRO

North Carolina Department of Environment and Natural Resources
Division of Air Quality
Air Pollutant Point Source Emissions Inventory – Calendar Year 2007

1. Emission Source ID (from permit) or Emission Source Group ID NS–H

2. Emission Source Description: Nafion membrane process [MACT FFFF]

3. Operating Scenario ID/Description: OS – 18/Nafion resin membrane treatment process

4. SCC Number/Description: 30199998/*Other Organic Chemica Manufacture Not Listed

5. Throughput/units in 2007:
(e.g. production or fuel use):

6. Fuel Information (If fuel is used)

% Sulfur		% Ash		Heat Content (Btu/units)	

7. Capture Efficiency
(% of Emissions from this Process Vented to Control Device or Stack):

8. Control Device Information :None

Order	CS–ID	CD ID (as listed in permit)	Control Device Description

9. Emission Release Point (ERP) Information: (Sources vented to more than one ERP use additional entry lines):

ERP ID	ERP Type	Height (in feet)	Diameter Circle (enter #): Rectangle (L x W) (in 0.1 feet)	Temperature (F)	Velocity (Feet/sec)	Volume Flow Rate (Acfm)	ERP Description
EP–NEP–H1	VERTICAL STACK	50	2	70	48	9047.78	Nafion resin membrane

Operating Scenario: OS – 18 **Emission Source/Group ID:** NS–H

10. Operating Schedule: (Source/Operating Scenario that best characterizes Calendar Year 2007)
Hours per Day (24) Days per Week (7) Weeks per Year (52)

11. Typical Start & End Times For Operating Scenario: Start: 0 End: 2359

12. Seasonal Periods Percent Annual Throughput:

Jan–Feb + Dec 2007	25%	March–May 2007	25%	June–Aug. 2007	25%	Sept.–Nov. 2007	25%

13. Actual Emissions per Pollutant Listed :
Attach calculations and documentation of emission factors or other estimation methods used.

GHG Pollutants	CAS	Emissions–GHG Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				

Criteria (NAAQS) Pollutants	Pollutant Code	Emissions–Criteria Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				
CO	CO		08			
NOx	NOx		08			
TSP	TSP		08			
PM10	PM10		08			
PM2.5	PM2.5		08			
SO2	SO2		08			
VOC	VOC	14.4	08			

HAP/TAP Pollutants (In Alphabetical Order)	CAS (see instructions)	Emissions HAP/TAPS (Pounds/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	EF Control
		2007				
Acetic acid	64–19–7	368	03			
Hydrogen fluoride (hydrofluoric acid as mass of HF–Component of Fluorides)	7664–39–3	109	02			

CONFIDENTIAL INFORMATION

Supporting documentation for the determination of air emissions from this emission source contains DuPont Confidential Business Information, which if made public would divulge the manufacturing method, process, and/or capacity, and has therefore been intentionally excluded from the Public Copy of this Air Emissions Inventory as allowed by North Carolina General Statutes §132-1.2, §143-215.3C(a), and §143-215.65.

AIR EMISSIONS INVENTORY SUPPORTING DOCUMENTATION

Emission Source ID No.: NS-H (NS-11) MEMBRANE TREATMENT

Emission Source Description: Nafion® resin membrane treatment process

Process Description: OS-18 / Nafion® resin membrane treatment processes

The resin membrane treatment process (hydrolysis) is carried out continuously by passing the film resin or laminated resin membrane through a succession of tanks containing the necessary reagent chemicals to complete the hydrolysis reaction. Chemically, the objective is to expose the membrane to the reagent solution under conditions of time, temperature, concentration and agitation which are sufficient to complete the desired reaction. Mechanically, the objective is to convey the sheet, that is changing in dimension as it reacts, through a series of vertical passes, in a number of tanks, in a straight line, at a constant tension, without folding, creasing or tearing.
The resin membrane treatment process is contained in a enclosed room. All emissions are contained within the room and vent through emission control stacks. Air is supplied into the room and vented on a once through
The resin membrane treatment process (extrusion) is carried out continuouly by melting resin polymer pellets into an single screw extruder, heating to high temperatures so as to melt the resin polymer and extruded into film sheet form.
The resin membrane treatment process (extrusion) is contained in an enclosed room. All emissions are contained within the room and vented through emission control stacks. Air is supplied into the room and vented on a once through basis.

Basis and Assumptions:

- vent to atmosphere via stack
- No fugitive emissions due to all emissions vented through stack.
- DMSO vapor pressure = 0.46 mm Hg @ 20°C
- KOH vapor pressure = 2.6 mm Hg @ 20°C
- HNO3 vapor pressure = 9 to 28 mm Hg @ 25°C
- CH3COOH or HOAc vapor pressure = 11.4 mm Hg @ 20°C
- DEG vapor pressure = 1 mm Hg @ 92°C
- NaOH vapor pressure = 13 mm Hg @ 60°C
- Molar volume of an Ideal Gas @ 0°C and 1 atm = 359 ft3/(lb-mole)
- Molecular Weight of DMSO = 78 (78 lb DMSO / mole DMSO)
- DMSO waste storage tank 6000 gallons.
- DMSO received in 55 gal drums, each drum weighing 500 lbs.

Emission Source ID No.: NS-H (NS-11) MEMBRANE TREATMENT

Information Inputs and Source of Inputs:

Information	Source
Total shipped DMSO waste (lb/yr) (#5 on State Inventory Form)	Global Supply Support. In 2003 DMSO waste material was internally disposed of by the site waste treatment plant. Pumping to waste treatment is covered below.
Vapor pressure	MSDS sheets for each chemical.
Waste in storage tank end of year	Maintenance facilitator end of year (Near 12/31) Starting in 2003 the inventory or tank level can be obtained from IP 21 7403LG tag.
storage tank size	Procedure PR-70, W1535321, or NBPF000351
DMSO waste to waste treatment	The material in the waste storage tank is routinely pumped to waste treatment facility. This occurs at a rate of 5 gpm. The pumping is tracked in the IP21 by tank inventory reductions and noted by the area ATO. The pumping is continuous.
Waste content in storage tank	From Procedure PR-70 soc's
DMSO inventory beginning of year	Shipping and Material Coordinator
DMSO inventory end of year	Shipping and Material Coordinator
DMSO drums received during the year	Shipping and Material Coordinator
Acetic Acid emissions	Nafion® Products Technical ATO quarterly report
Acetic Acid emissions rate	TA NF-01-1240 study by Lee Ann Kessler in 1999
Hydrolysis Product Produced (m2) by qrt	Master Production Scheduler via SAP BW Reporting
Hydrolysis Surface Treatment Product Produced (m2) by qrt	Master Production Scheduler via SAP BW Reporting
Hydrolysis hours of operation by qrt	Master Production Scheduler via SAP BW Reporting
SR resin extruded	Extrusion ATO, from Extrusion yield calculations
CR resin extruded	Extrusion ATO, from Extrusion yield calculations
HF formed from extruded resin	TA NF-01-1240 study by Lee Ann Kessler in 1999
VOC emission calculations	Nafion Membrane Treatment Process AEI calcs excel spreadsheet in Nafion(r), everyone, scarrepa, environmental, AEI calc NS-H & NS-I hydro extr & spray master form.

Emission source/Operating Scenario Data

1. Emission Source ID No.

Actual emissions per pollutant listed for source/process identified on page 1:

Criteria (NAAQS) pollutants	**Pollutant code**	**Emissions (tons/yr)**
Carbon Monoxide	CO	0
NOx	NOx	0
TSP	TSP	0
PM 2.5	PM-2.5	0
PM 10	PM-10	0
SO2	SO2	0
VOC	VOC	14.4

HAP/TAP pollutants	**CAS #**	**Emissions (lb/yr)**
Acetic Acid	64-19-7	368.0
Hydrogen Fluoride	7664-39-03	109

As entered in AERO

Facility Name: DuPont Company – Fayetteville Works
22828 NC Highway 87 West
Fayetteville, NC 28302

Facility ID : 0900009
Permit : 03735
County : Bladen
DAQ Region : FRO

North Carolina Department of Environment and Natural Resources
Division of Air Quality
Air Pollutant Point Source Emissions Inventory – Calendar Year 2007

1. **Emission Source ID (from permit) or Emission Source Group ID** NS–I
2. **Emission Source Description:** Nafion membrane coating [MACT FFFF]
3. **Operating Scenario ID/Description:** OS – 19/Nafion membrane coating process
4. **SCC Number/Description:** 30199998/*Other Organic Chemica Manufacture Not Listed
5. **Throughput/units in 2007:** (e.g. production or fuel use): 7850 GAL/yr
6. **Fuel Information** (If fuel is used)

% Sulfur		% Ash		Heat Content (Btu/units)	

7. **Capture Efficiency** (% of Emissions from this Process Vented to Control Device or Stack):

8. **Control Device Information :None**

Order	CS–ID	CD ID (as listed in permit)	Control Device Description

9. **Emission Release Point (ERP) Information: (Sources vented to more than one ERP use additional entry lines):**

ERP ID	ERP Type	Height (in feet)	Diameter Circle (enter #): Rectangle (L x W) (in 0.1 feet)	Temperature (F)	Velocity (Feet/sec)	Volume Flow Rate (Acfm)	ERP Description
EP–NEP–1	VERTICAL STACK	50	2	70	0.4	75.39	Nafion membrane coating

10. Operating Schedule: (Source/Operating Scenario that best characterizes Calendar Year 2007)
Hours per Day (24) Days per Week (7) Weeks per Year (16)

11. Typical Start & End Times For Operating Scenario: Start: 0 End: 2359

12. Seasonal Periods Percent Annual Throughput:

Jan–Feb + Dec 2007	24%	March–May 2007	29%	June–Aug. 2007	29%	Sept.–Nov. 2007	18%

13. Actual Emissions per Pollutant Listed :
Attach calculations and documentation of emission factors or other estimation methods used.

GHG Pollutants	CAS	Emissions–GHG Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				

Criteria (NAAQS) Pollutants	Pollutant Code	Emissions–Criteria Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				
CO	CO		08			
NOx	NOx		08			
TSP	TSP	0.28	08			
PM10	PM10	0.28	08			
PM2.5	PM2.5	0.28	08			
SO2	SO2		08			
VOC	VOC	24.3	08			

HAP/TAP Pollutants (In Alphabetical Order)	CAS (see instructions)	Emissions HAP/TAPS (Pounds/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	EF Control
		2007				

AIR EMISSIONS INVENTORY SUPPORTING DOCUMENTATION

Emission Source ID No.: NS-I MEMBRANE SPRAYBOOTH

Emission Source Description: Nafion® resin membrane spray booth treatment process

Process Description: OS-19 / Nafion® resin membrane spray booth treatment processes

The spray coating process supplies a thin uniform layer of coating (pigment & resin) solution to the surface of Nafion® membrane. This is accomplished in the following process Binder solution (Polymer and alcohol) is handled in 55 gallon drums and stored in an enclosed paint preparation room or temporarily on an outside pad prior to use. Pigment is received in 100 kg fiber packs and stored in the paint preparation area again prior to use. The coating (or paint) solution is prepared by adding measured amounts of binder solution, a wetting agent, pigment and alcohol to an agitated premix tank. The coating solution is then tested per specification. If acceptable, the material is put into carboys. If not acceptable, the material is blended or processed though various equipment until tested within specifications.

The acceptable coating solution is stored in carboys in the paint preparation area until needed for spray coating process. In the spray coating process the resin membrane is feed continuously through the spray booth while the coating material is "sprayed" onto the membrane. An automatic transverse machine carries two air jet spray guns back and forth in front of the membrane and applies a thin coating.

The volatile paint alcohol is evaporated in the top section of the spray booth and in the exit enclosure behind the top section of the spray booth, leaving a dry pigment/binder coating on the membrane's surface.

The resin membrane spray coating and coating preparation process is contained in a enclosed room. All emissions are contained within the room and vent through emission control stacks. Air is supplied into the rooms and vented on a once through basis. The ventilation system is designed for 2 to 5 minute air exchange rate.

Basis and Assumptions:

- vent to atmosphere via stack

- No fugitive emissions due to all emissions vented through stack.

- Total Suspended Particles are pigment and larger than 10 micron PM.

- Maximum coating rate is 180cc/min per spray gun design basis with air pressure at max soc's. For these calculations the products area is using a 10% above factor to ensure emissions are not under reported. Thus 200 cc/min is basis for rate.

- Density of coating material is 7.928 lbs/gal average. This is soc aim. Actual lab analysis is performed with verifies this average over annual time frame. Thus basis of calculation assumes 7.928 SOC average vs lab reported average.

- Density of coating material is 7.928 lbs/gal average. This is soc aim. Actual lab analysis is performed with varifies this average over annual time frame. Thus basis of calculation assumes 7.928 SOC average vs lab reported average.

- Solution make up alcohol concentrations are soc specification averages. COA's verify actual concentrations are at soc averages. Thus basis of calculation assumes soc average for solution concentrations.

- Coating solution solid concentrations are soc specification averages. Lab analysis is performed and verifies this average over annual time frame. Thus the basis of calculation assumes 18% solids in coating batch.

- Paint applications emissions arrestor efficiency is 95% based on equipment design specification. 5% of total solids are lost as air emissions.

Information Inputs and Source of Inputs:

Information	Source
Paint batches made	Spray coating run sheets & lab numbering system for each batch made.
Gallons/batch	PR-81 process SOC
Paint batches remade	Spray coating run sheets & lab numbering system for each batch made. Note that the lab numbering system will indicate R for remade batches.
Gallons added/remade batch	PR-81 process SOC
Coating Density	PR-81 process SOC
Binder solution make up	
% Ethanol	
% Methanol	
% 1-Propanol	PR-81 process SOC
Coating % solid pigment	PR-81 process SOC
Paint Arrestor efficiency	PR-81 process SOC
CA membrane Coated	Master Production Scheduler via SAP BW Reporting
Total hours of operation	Master Production Scheduler via SAP BW Reporting
% Hours operation per qrt	Master Production Scheduler via SAP BW Reporting

NS-I Membrane Spraybooth summary.

Max Spray Coat Rate	cc/min (2 guns)	400		From PR-81 in process specification spray gun maximum capability
Max Process Rate	gal/hr	6.3		=cc/min * 2.64E-4 gal/cc * 60 min/hr, conversion for cc/min to gal/hr
Paint Batches	batch	314	from spraycoating paint & binder lab results	From spraycoating run sheets on how many batches were made during the year. Note that lab sample analysis numbering system provides last 3 numbers which equals number of batches made and tested during the year ie 3FWC169 means that 169 batches were made in 2003.
Gallons/batch	gals	25		From PR-81 process specifications for batch size.
Gallons from Original batches	gals	7850		calculation from batch size * number of batches
Remade batches	batchs	0	from spraycoating paint & binder lab results NG first samples.	In 2003 we stopped tracking remade batchs as a separate process and combined this with the paint batch number.From spraycoating run sheets on how many batches were remade during the year. Note that the lab numbering system will indicate R for remade batches.
Gallons added/batch	gals	5		From PR-81 process specifications for remake batch size.
Gallons added to remake batchs	gals	0		calculation from gallons added * number of remade batches
Annual Process Throughput	gals/yr	7850		addition of original batches + remade batch gals producted. *This number is brought to NS-I summary sheet*
Coating Density	lb/gal	7.928		From PR-81 process specifications for coating batches
Coating Consumed	lbs/yr	62235		calculation of coating density * gals per year
VOC Emissions				
Ethanol	wt %	69%		From PR-81 process specification for binder solution make up
Methanol	wt %	1%		From PR-81 process specification for binder solution make up
1-Propanol	wt %	8%		From PR-81 process specification for binder solution make up

Annual VOC Emissions	lbs/yr	48543		calculation of voc components % * coating consumed
	tons/yr	24.3		conversion to tons lbs/2000lbs per ton. *This number is brought to NS-I summary sheet*

TSP Emissions				
Coating Solids	wt %	18%		From PR-81 process specifictions for coatings batch.
Paint Arrestor Effic	%	95%		From PR-81 equipment specifictions for coatings paint arrestor efficiency.
Solids Produced	lb/yr	11202		calculation of % coatings solids * coating consumed

Annual TSP Emissions	lbs/yr	560.1		=lbs/yr of coating consumed * wt% coating solids * (1-efficiency of arrestors) , calculation of emissions due to paint arrestor efficiency not 100%
total suspended particles	tons/yr	0.28		calculation from lbs per year to tons per year. *This number is brought to NS-I summary sheet*

Emission Source ID No. **NS-I**

Criteria (NAAQS) pollutants	Pollutant code	Emissions (tons/yr)
Carbon Monoxide	CO	0
NOx	NOx	0
TSP	TSP	0.28
PM 2.5	PM-2.5	0.28
PM 10	PM-10	0.28
SO2	SO2	0
VOC	VOC	24.3

As entered in AERO

Facility Name: DuPont Company – Fayetteville Works
22828 NC Highway 87 West
Fayetteville, NC 28302

Facility ID : 0900009
Permit : 03735
County : Bladen
DAQ Region : FRO

North Carolina Department of Environment and Natural Resources
Division of Air Quality
Air Pollutant Point Source Emissions Inventory – Calendar Year 2007

1. Emission Source ID (from permit) or Emission Source Group ID NS–J

2. Emission Source Description: Nafion semiworks [MACT FFFF]

3. Operating Scenario ID/Description: OS – 26/Nafion Semiworks A/E Laboratory NS–J3

4. SCC Number/Description: 30199999/*Other Organic Chemica Manufacture Not Listed

5. Throughput/units in 2007: 0
(e.g. production or fuel use):

6. Fuel Information (If fuel is used)

% Sulfur		% Ash		Heat Content (Btu/units)	

7. Capture Efficiency
(% of Emissions from this Process Vented to Control Device or Stack):

8. Control Device Information :None

Order	CS–ID	CD ID (as listed in permit)	Control Device Description

9. Emission Release Point (ERP) Information: (Sources vented to more than one ERP use additional entry lines):

ERP ID	ERP Type	Height (in feet)	Diameter Circle (enter #): Rectangle (L x W) (in 0.1 feet)	Temperature (F)	Velocity (Feet/sec)	Volume Flow Rate (Acfm)	ERP Description
EP–NEP–J2	VERTICAL STACK	26	1.9	70	23	3912.69	Nafion Semiworks SW–2

10. Operating Schedule: (Source/Operating Scenario that best characterizes Calendar Year 2007)
Hours per Day (24) Days per Week (7) Weeks per Year (52)

11. Typical Start & End Times For Operating Scenario: Start: 0 End: 2359

12. Seasonal Periods Percent Annual Throughput:

Jan–Feb + Dec 2007	25%	March–May 2007	25%	June–Aug. 2007	25%	Sept.–Nov. 2007	25%

13. Actual Emissions per Pollutant Listed :
Attach calculations and documentation of emission factors or other estimation methods used.

GHG Pollutants	CAS	Emissions–GHG Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				

Criteria (NAAQS) Pollutants	Pollutant Code	Emissions–Criteria Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				
CO	CO		08			
NOx	NOx		08			
TSP	TSP		08			
PM10	PM10		08			
PM2.5	PM2.5		08			
SO2	SO2		08			
VOC	VOC		08			

HAP/TAP Pollutants (In Alphabetical Order)	CAS (see instructions)	Emissions HAP/TAPS (Pounds/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	EF Control
		2007				

As entered in AERO

Facility Name: DuPont Company – Fayetteville Works
22828 NC Highway 87 West
Fayetteville, NC 28302

Facility ID : 0900009
Permit : 03735
County : Bladen
DAQ Region : FRO

North Carolina Department of Environment and Natural Resources
Division of Air Quality
Air Pollutant Point Source Emissions Inventory – Calendar Year 2007

1. Emission Source ID (from permit) or Emission Source Group ID NS–K

2. Emission Source Description: Nafion E–2 Process [MACT FFFF]

3. Operating Scenario ID/Description: OS – 27/Nafion E–Fluids production process

4. SCC Number/Description: 30199998/*Other Organic Chemica Manufacture Not Listed

5. Throughput/units in 2007:
(e.g. production or fuel use):

6. Fuel Information (If fuel is used)

% Sulfur		% Ash		Heat Content (Btu/units)	

7. Capture Efficiency
(% of Emissions from this Process Vented to Control Device or Stack):

8. Control Device Information :None

Order	CS–ID	CD ID (as listed in permit)	Control Device Description

9. Emission Release Point (ERP) Information: (Sources vented to more than one ERP use additional entry lines):

ERP ID	ERP Type	Height (in feet)	Diameter Circle (enter #): Rectangle (L x W) (in 0.1 feet)	Temperature (F)	Velocity (Feet/sec)	Volume Flow Rate (Acfm)	ERP Description
EP–NEP–1	VERTICAL STACK	50	2	70	0.4	75.39	Nafion membrane coating

Operating Scenario: OS – 27 **Emission Source/Group ID:** NS–K

10. Operating Schedule: (Source/Operating Scenario that best characterizes Calendar Year 2007)
Hours per Day (24) Days per Week (7) Weeks per Year (52)

11. Typical Start & End Times For Operating Scenario: Start: 0 End: 2359

12. Seasonal Periods Percent Annual Throughput:

Jan–Feb + Dec 2007	25%	March–May 2007	25%	June–Aug. 2007	25%	Sept.–Nov. 2007	25%

13. Actual Emissions per Pollutant Listed :
Attach calculations and documentation of emission factors or other estimation methods used.

GHG Pollutants	CAS	Emissions–GHG Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				

Criteria (NAAQS) Pollutants	Pollutant Code	Emissions–Criteria Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				
CO	CO		08			
NOx	NOx		08			
TSP	TSP		08			
PM10	PM10		08			
PM2.5	PM2.5		08			
SO2	SO2		08			
VOC	VOC	0.42	02			

HAP/TAP Pollutants (In Alphabetical Order)	CAS (see instructions)	Emissions HAP/TAPS (Pounds/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	EF Control
		2007				

CONFIDENTIAL INFORMATION

Supporting documentation for the determination of air emissions from this emission source contains DuPont Confidential Business Information, which if made public would divulge the manufacturing method, process, and/or capacity, and has therefore been intentionally excluded from the Public Copy of this Air Emissions Inventory as allowed by North Carolina General Statutes §132-1.2, §143-215.3C(a), and §143-215.65.

2007 AIR EMISSIONS INVENTORY SUPPORTING DOCUMENTATION

Emission Source ID No.: NS-K

Emission Source Description: Nafion E-Fluids Production Process

Process and Emission Description:

The E2 process is a batch manufacturing process. All emissions from this process vent to the atmosphere, some via a vertical stack. The control of emissions of certain compounds will be addressed in the attached spreadsheet.

Basis and Assumptions:

Engineering calculations using compositions, volumes and paritial pressures are used to determine amounts vented. See attached information for assumptions made for each vessel. A typical batch is ~ 220 kgs of E fluids with the following composition (86% E2, 10% E1 and 4% E3).

Information Inputs and Source of Info.:

Information Input	Source of Inputs
E2 production quantity	E2 Production Facilitator
Speciated emission rates	Attached calculations

Point Source Emissions Determination:

Point source emissions for individual components are given in the attached spreadsheet

Equipment Emissions and Fugitive Emissions Determination:

Emissions from equipment leaks which vent as stack (point source) emissions and true fugitive (non-point source) emissions have been determined using equipment component emission factors established by DuPont. The determination of those emissions are shown in a separate section of this supporting documentation.

Emission Summary

A. VOC Emissions by Compound and Source

Nafion® Compound	CAS Chemical Name	CAS No.	Point Source Emissions (lbs)	Fugitive Emissions (lbs)	Equipment Emissions (lbs)	Accidental Emissions (lbs)	Total VOC Emissions (lbs)
E1	Propane, 1,1,1,2,2,3,3-heptafluoro-3-(1,2,2,2-tetrafluoroethoxy)-	3330-15-2	397.4	36.7	6.3	0	440.5
E2	2H-perfluoro(5-methyl-3,6-dioxanonane)	3330-14-1	303.5	27.7	54.2	0	385.4
E3	2H-perfluoro-5,8-dimethyl-3,6,9-trioxadodecane	3330-16-3	2.7	0.3	2.5	0	5.4
	Total for 2007		703.6	64.6	63.0	0	831.3
						Tons	**0.42**

B. Interface Tank

The Interface Tank is a 30 gallon vessel. The E-fluids are seperated from aqueous material in the Transfer Tank and are sent to the Interface Tank. Once the Interface Tank is close to full, material is taken from the Interface Tank to a 55 gallon drum. Assume temperature is 30 degrees C and entire tank volume is vented during filling.

Calculations:

PV = nRT (assumes the Ideal Gas Law)

Tank Volume = 30 gallons / 7.48 gal/ft^3 = 4.01 ft^3

Contents of vessel :

Component	MW	Kgs	Moles	Mol %	Vapor Pressure (psia)	Partial Pressure* (psia)
E1	286	22.00	0.08	15.09	9.70	1.46
E2	452	189.20	0.42	82.12	0.85	0.70
E3	618	8.80	0.01	2.79	0.17	0.00
Total		220.00	0.51	100%		

* Partial Pressure = **Vapor Pressure** multiplied by **Mol%** divided by **100%**

Tank temperature = 30 degrees Celsius is equal to 545.69 degrees R

R = 10.73 psia-ft^3/lb-mol/degR

For E1: n = moles of E1 = (Partial pressure of E1) * (Volume) / (R) / (Temperature)

$$n = \frac{1.46 \text{ psia}}{10.73 \text{ psia-ft}^3\text{/lb-mol/degR}} \times \frac{4.01 \text{ ft}^3}{545.69 \text{ degrees R}} = 0.0010 \text{ lb-mol E1}$$

$$0.0010 \text{ lb-mol E1} \times \frac{286 \text{ lb E1}}{\text{lb-mol E1}} = \mathbf{0.29 \text{ lb E1/batch}}$$

For E2: n = moles of E2 = (Partial pressure of E2) * (Volume) / (R) / (Temperature)

$$n = \frac{0.70 \text{ psia}}{10.73 \text{ psia-ft}^3\text{/lb-mol/degR}} \times \frac{4.01 \text{ ft}^3}{545.69 \text{ degrees R}} = 0.0005 \text{ lb-mol E2}$$

$$0.0005 \text{ lb-mol E2} \times \frac{452 \text{ lb E2}}{\text{lb-mol E2}} = \mathbf{0.22 \text{ lb E2/batch}}$$

For E3: n = moles of E3 = (Partial pressure of E3) * (Volume) / (R) / (Temperature)

$$n = \frac{0.00 \text{ psia}}{10.73 \text{ psia-ft}^3\text{/lb-mol/degR}} \times \frac{4.01 \text{ ft}^3}{545.69 \text{ degrees R}} = 0.000003 \text{ lb-mol E3}$$

$$0.000003 \text{ lb-mol E3} \times \frac{618 \text{ lb E3}}{\text{lb-mol E3}} = \mathbf{0.002 \text{ lb E3/batch}}$$

Fugitive and Equipment Emissions Determination (Non-point Source):

Fugitive Emissions(FE) and Equipment Emissions (EE) are a function of the number of emission points in the plant (valves, flanges, pump seals). For the equpiment emission calculations the inventory shown below is conservative and based on plant and process diagrams. Note that the calculations below include equipment emissions inside buildings as well as vessel emissions outside (fugitive emissions).

A. Fugitive Emissions from Crude E-fluids tote:

This 180-gallon tote is filled with dry crude E-fluids from the 55 gallon drum. This material then gets transported to the Polymers area for use. This tote can hold several batches of material. This filling activity occurs on the outside of the E2 building. Assume the filling is at 30 degrees Celsius and assume that one batch of E-fluids displaces 33% of the tote, or 60 gallons of volume, during filling. These emissions will be "Fugitive" in nature.

Calculations:

PV = nRT (assumes the Ideal Gas Law)

33% Tote Volume = 60 gallons / 7.48 gal/ft^3 = 8.02 ft^3

Contents of vessel :

Component	MW	Kgs	Moles	Mol %	Vapor Pressure (psia)	Partial Pressure* (psia)
E1	286	22.00	0.08	15.09	9.70	1.46
E2	452	189.20	0.42	82.12	0.85	0.70
E3	618	8.80	0.01	2.79	0.17	0.0047
Total		220.00	0.51	100%		

* Partial Pressure = **Vapor Pressure** multiplied by **Mol%** divided by **100%**

Tank temperature = 30 degrees Celsius is equal to 545.69 degrees R

R = 10.73 psia-ft^3/lb-mol/degR

For E1: n = moles of E1 = (Partial pressure of E1) * (Volume) / (R) / (Temperature)

$$n = \frac{1.46 \text{ psia}}{10.73 \text{ psia-ft}^3\text{/lb-mol/degR}} \times \frac{8.02 \text{ ft}^3}{545.69 \text{ degrees R}} = 0.0020 \text{ lb-mol E1}$$

$$0.0020 \text{ lb-mol E1} \times \frac{286 \text{ lb E1}}{\text{lb-mol E1}} = \textbf{0.57 lb E1/batch}$$

For E2: n = moles of E2 = (Partial pressure of E2) * (Volume) / (R) / (Temperature)

$$n = \frac{0.70 \text{ psia}}{10.73 \text{ psia-ft}^3\text{/lb-mol/degR}} \times \frac{8.02 \text{ ft}^3}{545.69 \text{ degrees R}} = 0.0010 \text{ lb-mol E2}$$

$$0.0010 \text{ lb-mol E2} \times \frac{452 \text{ lb E2}}{\text{lb-mol E2}} = \textbf{0.43 lb E2/batch}$$

For E3: n = moles of E3 = (Partial pressure of E3) * (Volume) / (R) / (Temperature)

$$n = \frac{0.0047 \text{ psia}}{10.73 \text{ psia-ft}^3\text{/lb-mol/degR}} \times \frac{8.02 \text{ ft}^3}{545.69 \text{ degrees R}} = 0.000007 \text{ lb-mol E3}$$

$$0.000007 \text{ lb-mol E3} \times \frac{618 \text{ lb E3}}{\text{lb-mol E3}} = \textbf{0.004 lb E3/batch}$$

Total Fugitive Emissions from E2-Fluids process

Chemical	lb/batch	No. of batches	lbs
E1	0.57	64	36.7
E2	0.43	64	27.7
E3	0.004	64	0.3
Total			**64.6**

B. Equipment Emissions From Valves, Pumps and Flanges

The emission rates for valves, flanges, etc. have been established by the DuPont Company. The emission rates from these types of equipment in the E-fluids process is considered "Excellent" and therefore the following rates are use: valve = (0.00039 lb/hr), flange = (0.00018 lb/hr)

Calculations:

Valve emissions:	134 valves x 0.00039 lb/hr/valve	=	0.0523 0 lb/hr VOC
Flange emissions:	20 flanges x 0.00018 lb/hr/flange	=	0.0036 0 lb/hr VOC
Total equipment emission rate			0.0559 0 lb/hr VOC

VOC:		0.0559	lb/hr VOC
	x	1,128	operating hrs/year
	=	63.0	lb/yr VOC

By Component:

We will assume that equipment emissions are the same composition as the crude E-fluids (I.e. 10% E1, 86% E2, and 4% E3)

Total Equipment Emissions from E-fluids process:

Chemical	Chemical Fraction	Total Equipment Emission Rate (lb/yr)	Total Equipment Emission Rate (lb/yr)
E1	10%	63.0	6.3
E2	86%	63.0	54.2
E3	4%	63.0	2.5
Total			63.0

Where the **Chemical Emission Rate** equals the **Total Equipment Emission Rate** multiplied by the **Chemical Fraction**

As entered in AERO

Facility Name: DuPont Company – Fayetteville Works
22828 NC Highway 87 West
Fayetteville, NC 28302

Facility ID : 0900009
Permit : 03735
County : Bladen
DAQ Region : FRO

North Carolina Department of Environment and Natural Resources
Division of Air Quality
Air Pollutant Point Source Emissions Inventory – Calendar Year 2007

1. Emission Source ID (from permit) or Emission Source Group ID: NS–L

2. Emission Source Description: Nafion TFE/HCl separation unit

3. Operating Scenario ID/Description: OS – 20/Nafion Tetrafluoroethylene purification process

4. SCC Number/Description: 30199998/*Other Organic Chemica Manufacture Not Listed

5. Throughput/units in 2007: (e.g. production or fuel use):

6. Fuel Information (If fuel is used)

% Sulfur		% Ash		Heat Content (Btu/units)	

7. Capture Efficiency (% of Emissions from this Process Vented to Control Device or Stack): 100

8. Control Device Information :

Order	CS–ID	CD ID (as listed in permit)	Control Device Description
1	CS–6	NCD–Hdr–1	Baffle–plate scrubber (7,000 kilogram/hour liquid injection rate averaged over a 3–hour period)

9. Emission Release Point (ERP) Information: (Sources vented to more than one ERP use additional entry lines):

ERP ID	ERP Type	Height (in feet)	Diameter Circle (enter #): Rectangle (L x W) (in 0.1 feet)	Temperature (F)	Velocity (Feet/sec)	Volume Flow Rate (Acfm)	ERP Description
EP–NEP–Hdr1	VERTICAL STACK	85	3	75	58	24598.67	Nafion scrubber Hdr1

Operating Scenario: OS – 20 **Emission Source/Group ID:** NS–L

10. Operating Schedule: (Source/Operating Scenario that best characterizes Calendar Year 2007)
Hours per Day (24) Days per Week (7) Weeks per Year (52)

11. Typical Start & End Times For Operating Scenario: Start: 0 End: 2359

12. Seasonal Periods Percent Annual Throughput:

Jan–Feb + Dec 2007	25%	March–May 2007	25%	June–Aug. 2007	25%	Sept.–Nov. 2007	25%

13. Actual Emissions per Pollutant Listed :
Attach calculations and documentation of emission factors or other estimation methods used.

GHG Pollutants	CAS	Emissions–GHG Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				

Criteria (NAAQS) Pollutants	Pollutant Code	Emissions–Criteria Pollutants (Tons/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	Ef Control
		2007				
CO	CO		08			
NOx	NOx		08			
TSP	TSP		08			
PM10	PM10		08			
PM2.5	PM2.5		08			
SO2	SO2		08			
VOC	VOC	26.8	08	0		

HAP/TAP Pollutants (In Alphabetical Order)	CAS (see instructions)	Emissions HAP/TAPS (Pounds/Year)	Emission Estimation Method Code (See Instructions)	Control Efficiency (Net after all controls)	Emission Factor	EF Control
		2007				
Hydrogen chloride (hydrochloric acid)	7647–01–0	164	02	99.6		

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Emission Summary

A. VOC Compound Summary

NS-L TFE/HCl Separation Process			
Nafion® Compound	**CAS Chemical Name**	**CAS No.**	**Emission (lbs)**
TFE	Tetrafluoroethylene	116-14-3	53,668
		Total VOC Emissions (lbs)	**53,668**
		Total VOC Emissions (tons)	**26.8**

B. Toxic Air Pollutant Summary

NS-L TFE/HCl Separation Process			
Nafion® Compound	**CAS Chemical Name**	**CAS No.**	**Emission (lbs)**
HCl	Hydrogen Chloride	76-470-10	164.3

As entered in AERO

Facility Name: DuPont Company – Fayetteville Works
22828 NC Highway 87 West
Fayetteville, NC 28302

Facility ID : 0900009
Permit : 03735
County : Bladen
DAQ Region : FRO

North Carolina Department of Environment and Natural Resources
Division of Air Quality
Air Pollutant Point Source Emissions Inventory – Calendar Year 2007

1. Emission Source ID (from permit) or Emission Source Group ID SW–1

2. Emission Source Description: Semiworks polymerization operation

3. Operating Scenario ID/Description: OS – 24/Nafion Semiworks SW–1

4. SCC Number/Description: 30199999/*Other Organic Chemica Manufacture Not Listed

5. Throughput/units in 2007: (e.g. production or fuel use): 10000 KG/yr

6. Fuel Information (If fuel is used)

% Sulfur		% Ash		Heat Content (Btu/units)	

7. Capture Efficiency
(% of Emissions from this Process Vented to Control Device or Stack):

8. Control Device Information :None

Order	CS–ID	CD ID (as listed in permit)	Control Device Description

9. Emission Release Point (ERP) Information: (Sources vented to more than one ERP use additional entry lines):

ERP ID	ERP Type	Height (in feet)	Diameter Circle (enter #): Rectangle (L x W) (in 0.1 feet)	Temperature (F)	Velocity (Feet/sec)	Volume Flow Rate (Acfm)	ERP Description
EP–NEP–J1	VERTICAL STACK	28	2.3	70	24	5982.84	Nafion Semiworks SW–1