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Report

Date
April 2021

SOURCE EMISSIONS TESTING OF THE VINYL ETHERS NORTH CARBON BED

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SOURCE EMISSIONS TESTING OF THE VINYL ETHERS NORTH CARBON BED

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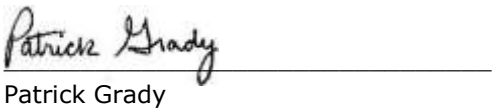
This report has been reviewed and to the best of our knowledge the report is complete, and the results presented herein are accurate, error free, legible, and representative of the actual emissions measured during testing.



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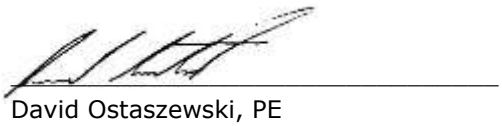

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1. INTRODUCTION AND BACKGROUND

Ramboll Americas Engineering Solutions, Inc. (Ramboll) was retained by The Chemours Company (Chemours) to conduct source emissions testing at its facility located in Fayetteville, North Carolina. Ramboll has prepared the following test report summarizing the results of the testing on behalf of Chemours.

1.1 Testing Objective

As provided in their Title V Air Permit, Chemours is required to evaluate hexafluoro-propylene oxide-dimer acid (HFPO-DA) emissions from a carbon bed adsorber at the Fayetteville Works facility. The objective of this test program was to collect field sample data from the inlet and outlet to the carbon bed serving the Vinyl Ethers North (VEN) process area to determine carbon bed replacement frequency.

The source emissions test program was performed on March 9, 2021. Messrs. Patrick Grady, Jeff Sheldon, Antonio Anderson and Brian Goodhile and Ms. Samantha Waters of Ramboll conducted the emissions testing. Ms. Christel Compton and Mr. Edward Vega coordinated process operations with the emissions testing. There were no representatives from any of the regulatory agencies present to observe the field test program.

This report presents a description of the sources tested, a summary of the scope of work conducted, sampling methods used, QA/QC procedures, and emission test results. The following section lists the testing program's participants and their contact information.

1.2 Emissions Testing Program Participants

Facility

Name:	The Chemours Company
Site Address:	22828 Hwy 87 W Fayetteville, NC 28306
Contact:	Christel E. Compton
e-mail:	christel.e.compton@chemours.com

Source Testing Firm

Name:	Ramboll
Address:	7600 Morgan Road Liverpool, NY 13090
Contact:	Patrick Grady
e-mail:	Patrick.grady@ramboll.com

Sample Analysis Laboratory

Name:	Eurofins TestAmerica, Knoxville
Address:	5815 Middlebrook Pike Knoxville, Tennessee 37921
Contact:	Courtney Adkins
e-mail:	courtney.adkins@testamericainc.com

2. PROCESS DESCRIPTION

This section provides a description of the VEN process.

2.1 Process Description

VEN is part of the fluoromonomer area at the Fayetteville facility. This area produces fluorocarbon compounds used to produce Chemours products, such as Nafion® Krytox® and Viton®. Indoor air fugitive emissions from VEN are vented to a carbon bed which is then vented to atmosphere through the Division Stack. Process emissions from VEN are directed to a thermal oxidizer.

2.2 Operating Conditions During Testing

Source emissions testing was performed during normal operations of the VEN process. Facility personnel monitored and recorded process operations during the testing. Copies of the operating data were provided to Ramboll and are included in Appendix A of this report.

3. SUMMARY OF TEST PROGRAM

This section provides a summary of the testing scope of work conducted. Test methods used during the sampling program can be found in Section 4 of this report.

3.1 Test Program Summary

Emissions testing was conducted simultaneously at the inlet and outlet of the VEN carbon bed and the Division Stack serving VEN in order to evaluate potential emissions and removal efficiencies of HFPO-DA. The testing at each location was conducted in triplicate and each test run was 96 minutes in duration. Results of the source emission testing are reported in units of milligrams per dry standard cubic meter (mg/dscm) and pounds per hour (lb/hr).

4. SAMPLING AND ANALYTICAL PROCEDURES

This section provides a description of the test methods that were utilized during the test program.

4.1 Test Methods

The test procedures were conducted in accordance with the most recent updates to the United States Environmental Protection Agency (USEPA) Reference Methods (RM) described in 40 CFR 60; Appendix A.

RM 1:	Sample and velocity traverses for stationary sources
RM 2:	Determination of stack gas velocity and volumetric flow rate (Type S pitot tube)
RM 3:	Determination of oxygen and carbon dioxide concentrations in emissions from stationary sources
RM 4:	Determination of moisture content in stationary sources
Modified 0010:	Determination of PFAS emissions from stationary sources (modified)

4.2 Sampling Locations

The sampling ports at the 36-inch inside diameter (ID) carbon bed inlet duct are located approximately 67 inches (1.9 diameters) downstream of a bend and approximately 61 inches (1.7 diameters) upstream of another bend. Test ports in the 36-inch ID carbon bed outlet duct are located approximately 58 inches (1.6 diameters) downstream of a bend and approximately 57 inches (1.6 diameters) upstream from another bend. A total of 12 traverse points were sampled on each diameter during each test run for a total of 24 traverse points at each test location. Traverse points were located in accordance with USEPA RM 1.

Test ports in the 34-inch ID Division Stack are located approximately 30 feet downstream (11 diameters) of a disturbance and approximately 9 feet (3.2 diameters) from the stack exit. In accordance with USEPA RM 1, 6 traverse points were sampled on each diameter. Note that due to limited access to one of the test ports sampling was only conducted on one diameter for each test run at the Division Stack. Also, note that this test location is not part of the required quarterly testing.

Schematics of the sample locations along with traverse point locations are provided in Appendix A.

4.3 Gas Velocity and Volumetric Flow Rate

Velocity was evaluated from differential pressure measurements using a stainless-steel Type-S pitot tube and oil manometer in accordance with USEPA RMs 1 and 2. These methods were conducted in conjunction with each test run. Exhaust gas volumetric flow rate in units of dry

standard cubic feet per minute (dscfm) were derived from velocity, temperature, molecular weight, and moisture measurements. Compound mass emission rates (lb/hr) were calculated using these volumetric flow rate data and compound concentrations.

4.4 Oxygen and Carbon Dioxide Concentrations

Concentrations of oxygen (O_2) and carbon dioxide (CO_2) were evaluated at both locations in accordance with modified USEPA RM 3 procedures using a Fyrite® combustion analyzer. A grab sample was collected and introduced into the Fyrite® for O_2 and CO_2 analysis.

4.5 Moisture Content

The moisture content of the sample trains was quantified utilizing procedures identified in USEPA RM 4. A sample of gas was continuously collected from each traverse point using a dry gas meter stack sampling system along with a series of impingers. The moisture content of the gas was measured as a change in the volume of the water collected in each impinger solution and the increased weight of the desiccant during the sampling period.

4.6 HFPO-DA Emissions

HFPO-DA emissions were evaluated in accordance with a modified USEPA Method 0010. The sample train consisted of a stainless-steel nozzle attached directly to a heated borosilicate glass-lined probe. The probe was connected directly to a heated borosilicate glass filter holder containing a solvent-extracted glass fiber filter. In order to minimize possible thermal degradation of the HFPO-DA, the probe and particulate filter were heated to just above stack temperature to minimize water vapor condensation before the filter. The filter holder exit was connected to a water-cooled coil condenser followed by a water-cooled sorbent module containing approximately 40 grams of XAD-2 resin. The XAD-2 inlet temperature was monitored to ensure that the module is maintained at a temperature below 20°C.

The XAD-2 resin trap was followed by a condensate knockout impinger and a series of two impingers each containing 100-ml of high purity deionized water. The water impingers were followed by another condensate knockout impinger equipped with a second XAD-2 resin trap to account for any sample breakthrough. The final impinger contained approximately 250 grams of dry pre-weighed silica gel. The water impingers and condensate impingers were submerged in an ice bath through the duration of the testing. The water in the ice bath was also used to circulate around the coil condenser and the XAD-2 resin traps.

Exhaust gases were extracted from the sample locations isokinetically using a metering console equipped with a vacuum pump, a calibrated orifice, oil manometer and probe/filter heat controllers.

4.6.1 HFPO-DA Sample Train and Equipment Preparation

Prior to conducting the field work the following procedures were conducted to prepare the field sampling glassware and sample recovery tools.

1. Wash all glassware, brushes, and ancillary tools with low residue soap and hot water.
2. Rinse all glassware, brushes, and ancillary tools three (3) times with D.I. H_20.
3. Bake glassware (with the exception of probe liners) at 450°C for approximately 2 hours, (XAD-2 resin tube glassware will be cleaned by Eurofins/TestAmerica by this same procedure).
4. Solvent rinse three (3) times all glassware, brushes, and ancillary tools with the following sequence of solvents: acetone, methylene chloride, hexane, and methanol.
5. Clean glassware and tools will be sealed in plastic bags or aluminum foil for transport to the sampling site.
6. Squirt bottles will be new dedicated bottles of known history and dedicated to the D.I. Water and methanol/ammonium hydroxide (MeOH/ 5% NH_4OH) solvent contents. Squirt bottles will be labelled with the solvent content it contains.

4.6.2 HFPO-DA Sample Train Recovery

Following completion of each test run, the sample probe, nozzle and front-half of the filter holder were brushed and rinsed three times each with the MeOH/ 5% NH_4OH solution (Container #1). The glass fiber filter was removed from its housing and transferred to a polyethylene bottle (Container #2). Any particulate matter and filter fibers which adhered to the filter holder and gasket were also placed in Container #2. The XAD-2 resin trap was sealed, labelled and placed in an iced sample cooler. The back-half of the filter holder, coil condenser condensate trap and connecting glassware were rinsed with the same MeOH/ 5% NH_4OH solution and placed in Container #3.

The volume of water collected in the second and third impingers was measured for moisture determinations and then placed in Container #4. Impingers #2 and #3 were then rinsed with the MeOH/ 5% NH_4OH solution and placed in Container #5. The second (breakthrough) XAD-2 resin trap was sealed, labelled and placed in an iced sample cooler. The second condensate trap was rinsed with the MeOH/ 5% NH_4OH solution and placed in Container #5. The contents of the fifth impinger were placed in its original container and weighed for moisture determinations.

Containers were sealed and labeled with the appropriate sample information. Samples remained chilled until analysis. HFPO-DA analysis was conducted using liquid chromatography/dual mass spectrometry (LC/MS/MS).

5. EMISSIONS TEST RESULTS

A detailed summary of the test results is presented in Table 1 in the appendix. Supporting field data and calculations can be found in Appendix C. The laboratory report is presented in Appendix D. A brief discussion of the test results is presented below.

5.1 Emission Test Results

Table 1 presents a detailed summary of the HFPO-DA test results. HFPO-DA concentrations at the carbon bed inlet ranged from 3.95E-01 mg/dscm to 3.72E+00 mg/dscm and averaged 1.54E+00 mg/dscm. Corresponding mass emissions of HFPO-DA ranged from 2.06E-02 lb/hr to 1.83E-01 lb/hr and averaged 7.63E-02 lb/hr.

Concentrations of HFPO-DA at the carbon bed outlet ranged from 2.19E-01 mg/dscm to 5.16E-01 mg/dscm and averaged 3.21E-01 mg/dscm. Mass emission rates of HFPO-DA from the carbon bed outlet ranged from 1.20E-02 lb/hr to 2.97E-02 lb/hr and averaged 1.80E-02 lb/hr. The resulting HFPO-DA removal efficiency of the VEN carbon bed averaged 76 percent.

A review of Table 1 indicates that HFPO-DA emissions at the carbon bed inlet dropped off significantly during Runs 2 and 3. There were no sampling issues or leak check problems of the sampling trains during any of the test runs. The decreased removal efficiency from the carbon bed during Runs 2 and 3 can be attributed to the lower fugitive emissions during these test runs.

5.2 Discussion and Conclusion

There were no sampling or process operating problems encountered during the field testing that impacted the test results. Therefore, all test data are believed to be representative of actual emissions in evidence during the test program.

6. QUALITY ASSURANCE/QUALITY CONTROL

QA/QC was based on the recommended QA/QC procedures of the various sampling and analytical methods that were used for the test program. This section summarizes the pertinent QA/QC procedures that were employed during the emissions testing program.

6.1 Equipment Calibration

An important aspect of pre-sampling preparations is the inspection and calibration of all equipment planned to be used for the field effort. Equipment is inspected for proper operation and durability prior to calibration. Calibration of equipment is conducted in accordance with the procedures outlined in the USEPA document entitled "Quality Assurance Handbook for Air Pollution Measurement Systems; Volume III—Stationary Source Specific Methods" (EPA-600/4-77-027b). Equipment calibration is performed in accordance with USEPA guidelines and/or manufacturer's recommendations. Examples of the typical calibration requirements of the field equipment being used are as follows:

- Pitot tubes (QA Handbook Section 3.1.2, pp. 1-13) - measured for appropriate spacing and dimensions or calibrate in a wind tunnel. Rejection criteria given on the calibration sheet. Post-test check - inspect for damage.
- Probe nozzles (QA Handbook Section 3.4.2, pg. 19) - make three measurements of the nozzle ID (to the nearest 0.001 in.) using different diameters with a micrometer. Difference between the high and low values should not exceed 0.004 in. Post-test check - inspect for damage.
- Thermocouples (QA Handbook Section 3.4.2, pp. 15-18) - verify against a mercury-in-glass thermometer at two or more points including the anticipated measurement range. Acceptance limits - impinger ±2°F; DGM ±5.4°F; stack ±1.5 percent of stack temperature.
- Dry gas meters (QA Handbook Section 3.4.2, pp. 1-12) - Dry gas meters are calibrated using critical orifices. The procedure entails four runs using four separate critical orifices running at an actual vacuum 1-2 in. greater than the theoretical critical vacuum. The minimum sample volume required per orifice is 5 ft^3. Meter boxes are calibrated annually and then verified by use of the alternative USEPA RM 5 post-test calibration procedure. This procedure is referenced as Approved Alternate Method ALT-009 (June 21, 1994) by USEPA's Emission Measurement Center. The average Y-value obtained by this method must be within 5% of the initial Y-value.

6.2 Equipment Leak Checks

Pitot tube leak checks were conducted in accordance with USEPA RM 2. Leak checks were conducted on the HFPO-DA sample trains prior to and following each test run in accordance with the procedures outlined in USEPA RM 5, Sections 8.4.1 and 8.4.2.

6.3 Reagent Blanks and Field Blanks

A field blank for the Modified USEPA RM 0010 sample train was collected as part of the test program. The blank train was assembled and set-up near one of the carbon bed outlet test locations and as close to the outlet sample train as possible. The blank train remained in place for the duration of the sampling run. The blank train was heated to the same temperature as used for the outlet sampling train, and the impinger portion of the train was iced down and chilled water circulated through the coil condenser as described in SW-846 Method 0010. The blank train was recovered in the same location, and by the same procedures as the actual sampling trains.

Additionally, a proof blank train rinse sample was collected one time during the sampling campaign. The glassware components of the train received a thorough solvent rinse after samples were recovered and put away for a sampling run. This secondary rinse was used to prove that the sampling breakdown collection processes capture all HFPO-DA material, and generally leave none of the target analytes uncaptured on the sample glassware. All sampling train glassware parts, including brushes and other tools used, were thoroughly rinsed with MeOH / 5% NH_4OH solution to evaluate the general rinsing efficiency of the sampling train recovery process.

Reagent blanks of the diH_2O used in the sample trains and MeOH/5% NH_4OH solution used for sample recovery were also submitted to the laboratory for analysis along with the field samples. Note that the field blank train and proof blank were collected during sampling of the Vinyl Ethers South carbon bed. Results of the field blank, proof blank and reagent blanks and are included with the laboratory reports in Appendix D.

6.4 Test Data and Report Review

Test data input and emission calculations were double-checked for accuracy. The test results were reviewed by senior personnel for reasonableness and accuracy. The final report was peer reviewed by senior personnel and certified by the project manager.

TABLES

Table 1
The Chemours Company - Fayetteville Works
Vinyl Ethers North Carbon Bed
Fayetteville, North Carolina

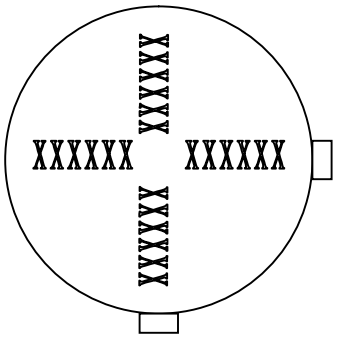
Run Identification	Run 1	Run 2	Run 3	Average	Run 1	Run 2	Run 3	Average
Source ID:	Carbon Bed Inlet				Carbon Bed Outlet			
Run Date	09Mar21	09Mar21	09Mar21		09Mar21	09Mar21	09Mar21	
Start/Stop Time	0852-1051	1135-1331	1436-1629		0852-1051	1135-1331	1436-1629	
Exhaust Gas Conditions								
Temperature (deg. F)	82	91	95	**89**	87	97	101	**95**
Moisture (volume %)	1.3	1.0	0.8	**1.0**	1.1	1.1	0.7	**1.0**
Oxygen (dry volume %)	20.9	20.9	20.9	**20.9**	20.9	20.9	20.9	**20.9**
Carbon Dioxide (dry volume %)	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Volumetric Flow Rate								
acfm	13,491	13,935	14,597	**14,008**	15,680	14,565	15,725	**15,324**
dscfm	13,107	13,375	13,927	**13,470**	15,348	13,996	15,043	**14,796**
HFPO - Dimer Acid								
mg/dscm	3.72E+00	5.12E-01	3.95E-01	**1.54E+00**	5.16E-01	2.28E-01	2.19E-01	**3.21E-01**
lb/hr	1.83E-01	2.56E-02	2.06E-02	**7.63E-02**	2.97E-02	1.20E-02	1.23E-02	**1.80E-02**
Carbon Bed Removal Efficiency								
percent	84	53	40	76				

APPENDIX A
PROCESS OPERATING DATA

Date **3/9/2021**

Time	800		900		1000		1100		1200		1300		1400		1500		1600	
Stack Testing			RUN 1: 0852-1051						RUN 2: 1135-1331						RUN 3: 1436-1629			
VEN Produ	PPVE																	
VEN Precursor																		
VEN Conde																		
VEN ABR																	Burnout	
VEN Refining																		
Stripper Column Vent																		

APPENDIX B
SCHEMATICS OF THE TEST LOCATIONS



Crossectional Area Showing
Velocity Traverse Point Locations

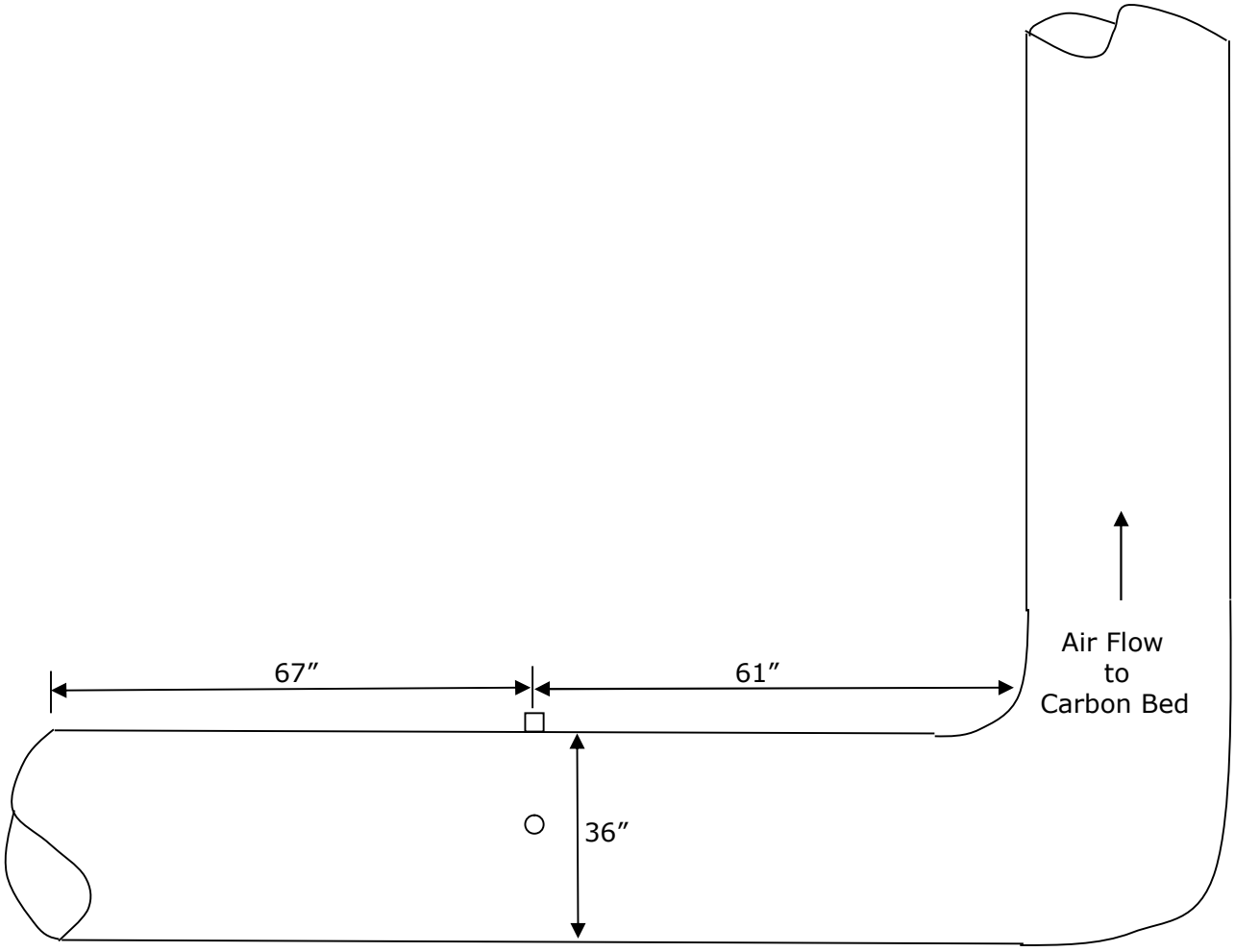


Figure 1
Carbon Bed Inlet Sampling Location
Vinyl Ethers North
The Chemours Company
Fayetteville, North Carolina

Sample Traverse Point Locations for Circular Stacks

Facility: The Chemours Company

Source Identification: VEN Carbon Bed Inlet

Stack Diameter: 36 inches

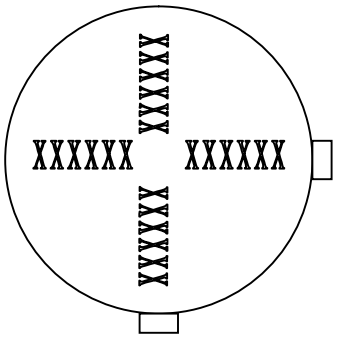
Sampling Locations: 1.9 diameters downstream
1.7 diameters upstream

Minimum Number of Traverse points as specified by EPA Method 1: 24

Number of traverse points sampled: 24

Traverse Point Number	Percent of Stack Diameter From Inside Wall	Distance in Inches From Inside Wall*
1	2.1	1.0
2	6.7	2.4
3	11.8	4.2
4	17.7	6.4
5	25.0	9.0
6	35.6	12.8
7	64.4	23.2
8	75.0	27.0
9	82.3	29.6
10	88.2	31.8
11	93.3	33.6
12	97.9	35.0

*Traverse points located within 1.00" to the stack wall for stacks having an inside diameter greater than 24" will be relocated as well as traverse points located within 0.50 inches to the stack wall on stacks with a 24" ID or less to meet criteria.



Crossectional Area Showing
Velocity Traverse Point Locations

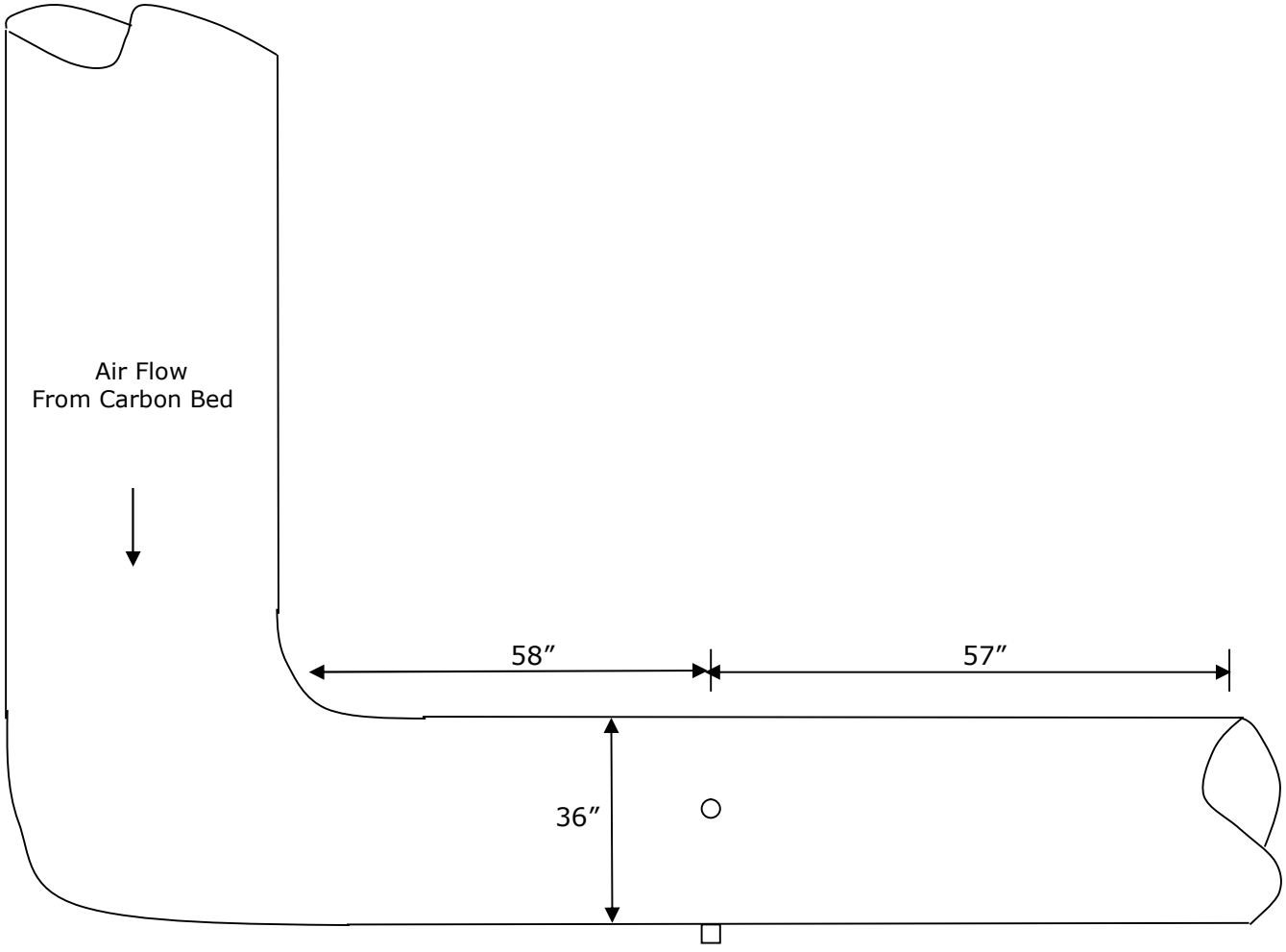


Figure 2
Carbon Bed Outlet Sampling Location
Vinyl Ethers North
The Chemours Company
Fayetteville, North Carolina

Sample Traverse Point Locations for Circular Stacks

Facility: The Chemours Company

Source Identification: VEN Carbon Bed Outlet

Stack Diameter: 36 inches

Sampling Locations: 1.6 diameters downstream
1.6 diameters upstream

Minimum Number of Traverse points as specified by EPA Method 1: 24

Number of traverse points sampled: 24

Traverse Point Number	Percent of Stack Diameter From Inside Wall	Distance in Inches From Inside Wall*
1	2.1	1.0
2	6.7	2.4
3	11.8	4.2
4	17.7	6.4
5	25.0	9.0
6	35.6	12.8
7	64.4	23.2
8	75.0	27.0
9	82.3	29.6
10	88.2	31.8
11	93.3	33.6
12	97.9	35.0

*Traverse points located within 1.00" to the stack wall for stacks having an inside diameter greater than 24" will be relocated as well as traverse points located within 0.50 inches to the stack wall on stacks with a 24" ID or less to meet criteria.

APPENDIX C
FIELD DATA AND CALCULATIONS

VEN Carbon Bed Inlet Field Test Data

Field Data Summary
The Chemours Company - Fayetteville Works
Vinyl Ethers North Carbon Bed Inlet
Fayetteville, North Carolina

	Run 1							Run 2							Run 3					
Traverse Point	Stack Temp(F)	Delta P	Delta H	Tm(F) in	Tm(F) out	SQRT Delta P		Stack Temp(F)	Delta P	Delta H	Tm(F) in	Tm(F) out	SQRT Delta P		Stack Temp(F)	Delta P	Delta H	Tm(F) in	Tm(F) out	SQRT Delta P
A1	74	0.21	0.67	47	45	0.4583		88	0.25	0.80	73	74	0.5000		93	0.25	0.80	80	76	0.5000
2	75	0.20	0.64	50	46	0.4472		89	0.25	0.80	74	74	0.5000		93	0.25	0.80	80	76	0.5000
3	77	0.28	0.90	53	47	0.5292		89	0.28	0.90	75	74	0.5292		93	0.25	0.80	81	76	0.5000
4	80	0.30	0.96	55	48	0.5477		89	0.29	0.93	76	74	0.5385		93	0.30	0.96	81	78	0.5477
5	81	0.31	0.99	57	49	0.5568		89	0.29	0.93	76	74	0.5385		94	0.30	0.96	81	78	0.5477
6	81	0.32	1.02	59	50	0.5657		89	0.29	0.93	76	73	0.5385		95	0.34	1.09	81	78	0.5831
7	81	0.36	1.15	60	51	0.6000		89	0.31	0.99	76	74	0.5568		95	0.38	1.22	81	78	0.6164
8	82	0.40	1.28	63	56	0.6325		89	0.31	0.99	77	73	0.5568		95	0.35	1.12	81	77	0.5916
9	82	0.41	1.31	63	56	0.6403		90	0.35	1.12	77	73	0.5916		95	0.38	1.22	80	77	0.6164
10	82	0.41	1.31	66	56	0.6403		90	0.35	1.12	77	74	0.5916		95	0.40	1.28	80	77	0.6325
11	82	0.42	1.34	68	58	0.6481		90	0.39	1.25	78	74	0.6245		95	0.40	1.28	80	76	0.6325
12	82	0.42	1.34	70	59	0.6481		90	0.39	1.25	78	74	0.6245		95	0.40	1.28	80	76	0.6325
B1	84	0.32	1.02	73	69	0.5657		91	0.34	1.09	76	76	0.5831		96	0.44	1.41	76	75	0.6633
2	84	0.32	1.02	74	70	0.5657		91	0.34	1.09	77	76	0.5831		95	0.42	1.34	78	75	0.6481
3	84	0.34	1.09	77	71	0.5831		91	0.37	1.18	79	76	0.6083		96	0.42	1.34	79	75	0.6481
4	85	0.34	1.09	78	72	0.5831		92	0.40	1.28	79	76	0.6325		95	0.42	1.34	80	75	0.6481
5	85	0.34	1.09	80	73	0.5831		92	0.42	1.34	80	77	0.6481		96	0.43	1.38	80	75	0.6557
6	85	0.32	1.02	81	75	0.5657		92	0.42	1.34	81	77	0.6481		96	0.43	1.38	80	75	0.6557
7	85	0.28	0.90	82	76	0.5292		92	0.33	1.06	81	77	0.5745		96	0.43	1.38	80	75	0.6557
8	85	0.28	0.90	82	78	0.5292		92	0.30	0.96	82	78	0.5477		96	0.35	1.12	81	75	0.5916
9	85	0.25	0.80	83	78	0.5000		92	0.32	1.02	82	78	0.5657		95	0.35	1.12	81	75	0.5916
10	86	0.25	0.80	82	78	0.5000		92	0.34	1.09	82	78	0.5831		95	0.35	1.12	81	75	0.5916
11	86	0.26	0.83	82	78	0.5099		92	0.32	1.02	82	78	0.5657		95	0.33	1.05	81	75	0.5745
12	86	0.27	0.86	81	79	0.5196		92	0.32	1.02	83	79	0.5657		96	0.33	1.05	81	75	0.5745
						0.0000							0.0000							0.0000
						0.0000							0.0000							0.0000
						0.0000							0.0000							0.0000
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						0.0000							0.0000							0.0000
						0.0000							0.0000							0.0000
						0.0000							0.0000							0.0000
						0.0000							0.0000							0.0000
						0.0000							0.0000							0.0000
						0.0000							0.0000							0.0000
Average	82	0.32	1.01	69	63	0.5603		91	0.33	1.06	78	75	0.5748		95	0.36	1.16	80	76	0.6000

Test Data Summary and Calculations
The Chemours Company - Fayetteville Works
Vinyl Ethers North Carbon Bed Inlet
Fayetteville, North Carolina

Parameter	**Run 1**	**Run 2**	**Run 3**
Run Date	3/9/21	3/9/21	3/9/21
Start/Stop Time	0852-1051	1135-1331	1436-1629
Duration of Run, Minutes	96	96	96
Ave. Nozzle Diameter, inches	0.243	0.243	0.243
Pitot Calibration Factor, CF	0.84	0.84	0.84
Meter Gamma	1.002	1.002	1.002
Meter Delta H, inches of H2O	1.6	1.6	1.6
Stack Diameter, inches	36	36	36
Rectangular Width, inches	0	0	0
Rectangular Length, inches	0	0	0
Stack Area, sq.ft.	7.07	7.07	7.07
Barometric Pressure, inches of Hg	30.5	30.5	30.5
Static Pressure, inches of H2O	-3.5	-3.5	-3.5
Dry Gas Meter Sample Volume, (VM)ft3			
Initial	927.572	985.086	44.759
Final	984.948	1042.671	105.524
Total Volume	57.188	57.444	60.55
Ave. Stack Temperature, Ts(F)	82.5	90.5	94.9
Ave. Meter Temperature, Tm(F)	66.3	76.8	78.1
Ave. Run Delta H, inches of H2O	1.01	1.06	1.16
Ave. Square Root of Delta P	0.5603	0.5748	0.6000
Moisture Data			
Volume of water collected, mls	4.8	1.2	0.4
Silica Gel, grams	11	11.2	10
Total Collected, mls	15.8	12.4	10.4
ORSAT Data			
%O2	20.90	20.90	20.90
%CO2	0.0	0.0	0.0
%CO			

Calculations

Vw(std), scf =	0.744	0.584	0.490
Vm(std), dscf =	58.741	57.857	60.860
Bws=	0.013	0.010	0.008
Md=	28.84	28.84	28.84
Ms=	28.70	28.73	28.75
Vs, ft/sec =	31.8	32.9	34.4
Qs, acfm =	13,491	13,935	14,597
Qs(std), dscfm =	13,107	13,375	13,927
Isokinetic Sampling Rate, %	102.5	98.9	99.9

Where:
An = area of the nozzle
As = area of the stack
Vw(std) = volume of water vapor in gas, standard conditions = 0.04707*Vlc
Vm(std) = vol. of gas sampled, standard conditions = 17.647 x Vm x gamma x [Pb + (dH/13.6)]/Tm(R)
Bws = water vapor in gas stream, proportion by volume = Vw(std)/(Vm(std) + Vw(std))
Md = molecular weight of stack gas, dry basis = (0.44 x%CO2) + (0.32 x%O2) + [0.28 x (%N2 + %CO)]
Ms = molecular weight of stack gas, wet basis = [Md x (1-Bws)] + (18.0 x Bws)
Vs = stack gas velocity = 85.49 x Cp x (avg. Sq.Rt. dP) x [Sq.Rt. (Ts(R))/(Ms x Ps)]
Qs = stack gas flow rate = Vs x As x 60
Qs(std) = stack gas flow rate, standard conditions = Qs x (1-Bws) x (528/(Ts(R)) x (Ps/29.92)
Isokinetic sampling rate = {(Ts(R)) x [(0.00267 x Vlc) + (Vm(std)/17.647)] x 100}/(Time x vs x Ps x An x60)

Results Summary
The Chemours Company - Fayetteville Works
Vinyl Ethers North Carbon Bed Inlet
Fayetteville, North Carolina

Parameter:		Run 1				Run 2				Run 3				Average			
	Mol. Wt.	mg	mg/dscm	ppm	lb/hr	mg	mg/dscm	ppm	lb/hr	mg	mg/dscm	ppm	lb/hr	mg	mg/dscm	ppm	lb/hr
HFPO - Dimer Acid	330	6.19125	3.72E+00	2.71E-01	1.83E-01	0.83829	5.12E-01	3.73E-02	2.56E-02	0.68042	3.95E-01	2.88E-02	2.06E-02	2.57	1.54E+00	1.12E-01	7.63E-02

Where:
Pollutant Emission Concentration:
mg= total sample collected, milligrams
mg/dscm = milligrams of pollutant per dry standard cubic meter sampled = (mg/dscf) x (35.314 cubic feet/cubic meter)
ppm = parts per million =((mg/dscm x 24.04 liters/mol)/mol.wt))

Pollutant Emission Rate:
lb/hr = pounds of pollutant emitted per hour = mg/1000/[(453.59 g/lb)/(dscf)] x dscfm x 60 min/hr

Example Calculations

The Chemours Company - Fayetteville Works
Vinyl Ethers North Carbon Bed Inlet
Fayetteville, North Carolina
Note: Values are shown for example purposes only.

Vm,a = Dry gas volume at actual conditions (acf)

Initial gas meter volume:	927.572
Final gas meter volume:	984.948
Difference:	57.376

Vm,std = Volume of dry gas at standard conditions (dscf)

= 17.647x Vm, a x Gamma*[Pbar+(DeltaH/13.6)]/Tm(R)
= 17.647 x 0.000 x 1.002 x (30.50 + [(1.600 /13.6) / 526
= 58.741

Vl,c = Volume of water collected in impingers and silica gel (ml)

impinger catch (mls):	5
silica gel (g)	11.0
total:	15.8

Vw,std = Volume of water vapor in gas at standard conditions (cu.ft.)

= (0.04707) x (Vl,c)
= 0.04707 x 15.8
= 0.744

Bwo = Proportion by volume of water vapor in gas stream

= Vw,std/(Vw,std+Vm,std)
= 0.74 / (0.74 + 58.741)
= 0.013

Ps = Stack gas static pressure (in. Hg)

= St/13.6
= -3.50 / 13.6
= -0.257

Pa = Absolute stack gas pressure (in. Hg)

= Ps+Pbar
= -0.257 + 30.50
= 30.24

MFD = Dry mole fraction of stack gas

= 1-Bwo
= 1 - 0.013
= 0.987

Md = Dry molecular weight of stack gas (lb/lb-mol)

= (0.32 x %O2) + (0.44 x %CO2) + (0.28 x %N2)
= (0.32 x 20.90)+(0.44 x 0.00) + (0.28 x 79.10)
= 28.84

Mw = Wet molecular weight of stack gas (lb/lb-mol)

= (Md) x (MFD) + (0.18) x (Bwo*100)
= 28.84 x 0.987 + 0.18 x 1.25024
= 28.70

Example Calculations

The Chemours Company - Fayetteville Works
Vinyl Ethers North Carbon Bed Inlet
Fayetteville, North Carolina
Note: Values are shown for example purposes only.

Vs,avg = **Average stack gas velocity (fps)**
= Kp x (Cp) x (sqrt,deltaP) x sqrt((Ts + 460°R)/Mw*Pa))
= 85.48 x 0.84 x 0.56 x sqrt (0.62)
= 31.8

A **Cross sectional areas of stack (sq. ft)**
= pi/4*d^2
= 3.14159/4 x 3.00 ^2
= 7.07

Qa **Volumetric flow rate at actual conditions (acfm)**
= (60)sec/min(A)(Vs, avg)
= 60 x 7.0686 x 31.81
= 13,490

Qstd **Volumetric flow rate at standard conditions (scfm)**
= Qa x (528/Ts,avg + 460) x Pa/29.92
= 13,490 x (528 / 542) x 1.011
= 13,272

Qstd,dry **Volumetric flow rate at dry standard conditions per minute(dscfm)**
= Qstd x (1-Bwo)
= 13,272 x 0.9875
= 13,106

mg/dscm **HFPO-DA concentration**
= (mg/dscf) x 35.314 cu. ft./cu. meter
= (6.19 / 58.74) x 35.314
= 3.72E+00

lb/hr **HFPO-DA Mass Emission Rate**
= mg/1000/[(453.59 g/lb)/(dscf)] x dscfm x 60 min/hr
= 6.19 / 1,000 /[453.59) / 58.74)] x 13,107 x 60
= 1.83E-01

Sample Train Recovery Data Sheet

Client The Chemours Co. **Location** Fayetteville, NC **Source** VEN Inlet **Method** Modified 0010 **Date** 3/9/2021

Run # 1

	Final ml or gm	Initial ml or gm	Net Gain	
Impinger #1	446.8	446.0	0.8	
Impinger #2	769.4	769.4	0.0	
Impinger #3	740.6	739.2	1.4	
Impinger #4	756.4	755.2	1.2	
Impinger #5	500.4	499.0	1.4	
Impinger #6	856.4	845.4	11.0	
Impinger #7			0.0	
Impinger #8			0.0	
		Total Gain	15.8	**ml/gm**

Filter #1
Filter #2
Filter #3
Run Start Time 852
Run End Time 1051
Recovery Technician PG

Run # 2

	Final ml or gm	Initial ml or gm	Net Gain	
Impinger #1	492.0	491.8	0.2	
Impinger #2	788.8	790.0	-1.2	
Impinger #3	785.8	786.0	-0.2	
Impinger #4	682.6	681.8	0.8	
Impinger #5	516.6	515.0	1.6	
Impinger #6	854.2	843.0	11.2	
Impinger #7			0.0	
Impinger #8			0.0	
		Total Gain	12.4	**ml/gm**

Filter #1
Filter #2
Filter #3
Run Start Time 1135
Run End Time 1331
Recovery Technician PG

Run # 3

	Final ml or gm	Initial ml or gm	Net Gain	
Impinger #1	449.0	448.2	0.8	
Impinger #2	772.0	774.2	-2.2	
Impinger #3	749.4	750.2	-0.8	
Impinger #4	760.0	759.6	0.4	
Impinger #5	502.8	500.6	2.2	
Impinger #6	866.2	856.2	10.0	
Impinger #7			0.0	
Impinger #8			0.0	
		Total Gain	10.4	**ml/gm**

Filter #1
Filter #2
Filter #3
Run Start Time 1436
Run End Time 1629
Recovery Technician PG

RAMBOLL

EPA Isokinetic Field Sheet

Methods Performed: Modified 0010

Client	The Chemours Company	Run Number	1	Pitot Number	P4-2/TC5D
Location	Fayetteville, NC	Stack Diameter	36"	Pitot Coefficient	0.84
Source	VEN Inlet	Barometric Pres.	30.50	Stack TC I.D.	P4-2/TC5D
Date	3/9/21	Static Pressure	-3.5	Oven Box I.D.	OB2
Operators	BG/JS	Meter Box #	3	Impinger Out I.D.	6
Start Time	0852	Meter delta H	1.60	Nozzle Size	.243
End Time	1051	Meter Gamma	1.002	XAD Trap I.D.	

Leak Check Rates	Sample Rate in.	Sample Rate cfm	Pitot +	Pitot -
Initial	12	0.005	✓	✓
Mid	9	0.005		
Mid	8	0.005		
Final	10	0.007	✓	✓

Sample Point	Sample Time (min)	Velocity Head (in. H_2O)	Orifice Setting (in. H_2O)	Meter Volume (ft^3)	Temperature Readings in Degrees Farenheit: Stack	Probe	Oven Box	Impinger	Aux	Meter Inlet	Meter Outlet	Vacuum (in. hg)	Comments/Notes K = 3.2
1	4	0.21	0.67	927.572	74	80	82	44	44	47	45	3	
2	8	0.20	0.64	930.5	75	79	80	39	43	50	46	3	
3	12	0.28	0.90	932.6	77	82	82	38	44	53	47	3	
4	16	0.30	0.96	—	80	84	85	38	46	55	48	3	
5	20	0.31	0.99	936.8	81	86	87	38	47	57	49	4	
6	24	0.32	1.02	—	81	87	86	38	49	59	50	4	
7	28	0.36	1.15	941.9	81	87	87	38	49	60	51	4	
8	32	0.40	1.28	944.1	82	88	87	39	51	63	56	5	
9	36	0.41	1.31	~~944~~	82	88	86	38	51	63	56	5	
10	40	0.41	1.31	949.2	82	89	89	39	53	66	56	5	
11	44	0.42	1.34	951.7	82	90	90	39	55	68	58	5	
12	48	0.42	1.34	954.4	82	89	90	40	56	70	59	5	STOP 0940
		—	—	956.664	—	—	—	—	—	—	—	—	
1	52	0.32	1.02	956.852	84	89	90	45	37	73	69	5	START 1003
2	56	0.32	1.02	959.2	84	91	90	39	36	74	70	5	
3	60	0.34	1.09	961.7	84	90	92	38	36	77	71	5	
4	64	0.34	1.09	—	85	91	91	39	35	78	72	5	
5	68	0.34	1.09	—	85	91	95	40	35	80	73	5	
6	72	0.32	1.02	—	85	94	92	40	39	81	75	5	
7	76	0.28	0.90	971.6	85	91	89	40	40	82	76	5	
8	80	0.28	0.90	974.1	85	90	89	41	44	82	79	5	
9	84	0.25	0.80	—	85	91	89	42	37	83	78	5	
10	88	0.25	0.80	978.3	86	90	90	41	36	82	78	5	
11	92	0.26	0.83	980.5	86	92	91	41	35	82	78	5	
12	96	0.29	0.90	982.7	86	91	93	41	36	81	79	5	
				984.948									

Impinger Data (vol) #	Initial	Final
1	0	
2	100	
3	100	
4	0	
5	SiGel	
6		

Silica Gel Data (gm) #	Initial	Final
1		
2		

Moisture Gain	
	ml.
	gm
	Total

Filter Data #	Number	Tare
1		
2		
3		

Molecular Weight Data (% #	O_2	CO_2
1		
2		
3		
Avg		

EPA Isokinetic Field Sheet

Methods Performed: Modified 0010

Client	The Chemours Company	Run Number	2	Pitot Number	P4-2/TC5D
Location	Fayetteville, NC	Stack Diameter	36"	Pitot Coefficient	0.84
Source	VEN Inlet	Barometric Pres.	30.50	Stack TC I.D.	TC5D
Date	3/9/21	Static Pressure	-3.5	Oven Box I.D.	OB2
Operators	BB/SS	Meter Box #	3	Impinger Out I.D.	3
Start Time	1135	Meter delta H	1.60	Nozzle Size	.243
End Time	1331	Meter Gamma	1.002	XAD Trap I.D.	

Leak Check Rates

	Sample Rate in.	Sample Rate cfm	Pitot +	Pitot -
Initial	10	0.006	✓	✓
Mid	9	0.005		
Mid	8	0.005		
Final	8	0.006	✓	✓

Sample Point	Sample Time (min)	Velocity Head (in. H_2O)	Orifice Setting (in. H_2O)	Meter Volume (ft^3)	Temperature Readings in Degrees Farenheit: Stack	Probe	Oven Box	Impinger	Aux	Meter Inlet	Meter Outlet	Vacuum (in. hg)	Comments/Notes K=3.2
1	4	0.25	0.80	985.086	88	94	93	50	48	73	74	3	
2	8	0.25	0.80	987.2	89	96	94	46	44	74	74	3	
3	12	0.28	0.90	989.5	89	94	96	44	48	75	74	3	
4	16	0.29	0.93	991.6	89	95	94	44	48	76	74	3	
5	20	0.29	0.93	993.8	89	95	94	45	47	76	74	3	
6	24	.29	0.93	996.—	89	94	93	46	47	76	73	3	
7	28	.31	0.99	998.9	89	94	95	46	47	76	74	3	
8	32	.31	.99	—	89	94	95	45	47	77	73	3	
9	36	.35	1.12	1002.9	90	94	95	45	48	77	73	3	
10	40	.35	1.12	1005.7	90	94	95	45	48	77	74	4	
11	44	.39	1.24	1008.0	90	94	95	45	48	78	74	4	
12	48	.39	1.24	1010 — 1013.031	90	94	94	45	48	78	74	4	1223 1243
1	52	0.34	1.09	1013.172	91	96	98	52	48	76	76	4	
2	56	0.34	1.09	1015.6	91	97	99	43	46	77	76	4	
3	60	0.37	1.18	—	91	98	98	42	45	79	76	4	
4	64	0.40	1.28	1020.4	92	98	97	43	47	79	76	4	
5	68	0.42	1.34	1022.9	92	97	99	43	46	80	77	4	
6	72	0.42	1.34	1025.6	92	97	98	44	46	81	77	4	
7	76	0.33	1.06	1028.4	92	95	97	44	47	81	77	4	
8	80	0.30	0.96	1030.7	92	95	98	45	47	82	78	4	
9	84	0.32	1.02	1033.0	92	96	97	44	46	82	78	4	
10	88	0.34	1.09	1035.3	92	95	97	45	45	82	78	4	
11	92	0.32	1.02	1037.9	92	96	98	45	46	82	78	4	
12	96	0.32	1.02	1040.2	92	98	99	45	47	83	79	4	
				1042.671									

Impinger Data (vol)

#	Initial	Final
1	0	
2	100	
3	100	
4	0	
5	SiGel	
6		

Silica Gel Data (gm)

#	Initial	Final
1		
2		

Moisture Gain

_____ ml,
_____ gm

_____ Total

Filter Data

#	Number	Tare
1		
2		
3		

Molecular Weight Data (%

#	O_2	CO_2
1		
2		
3		
Avg		

RAMBOLL

EPA Isokinetic Field Sheet

Methods Performed MODIFIED 0010

Client	THE CHEMOURS COMPANY	Run Number	3	Pitot Number	P4-2
Location	FAYETTEVILLE, NC	Stack Diameter	36"	Pitot Coefficient	0.84
Source	VEN INLET	Barometric Pres.	30.50	Stack TC I.D.	TC 5D
Date	3/9/21	Static Pressure	-3.5"	Oven Box I.D.	OB2
Operators	BC/JS	Meter Box #	3	Impinger Out I.D.	IO 6
Start Time	1436	Meter delta H	1.60	Nozzle Size	0.243
End Time	1629	Meter Gamma	1.002	XAD Trap I.D.	

Leak Check Rates				
	Sample Rate in.	cfm	Pitot +	Pitot -
Initial	10	0.012	✓	✓
Mid	7	6.010		
Mid	8	0.009		
Final	9	0.010	✓	✓

Sample Point	Sample Time (min)	Velocity Head (in. H_2O)	Orifice Setting (in. H_2O)	Meter Volume (ft^3)	Temperature Readings in Degrees Farenheit: Stack	Probe	Oven Box	Impinger	Aux	Meter Inlet	Meter Outlet	Vacuum (in. hg)	Comments/Notes
1	4	0.25	0.80	44.759	93	97	98	56	52	80	76	3	
2	8	0.25	0.80	—	93	96	98	52	48	80	76	3	
3	12	0.25	0.80	—	93	97	97	49	46	81	76	3	
4	16	0.30	0.96	52.1	93	96	98	48	44	81	78	3	
5	20	0.30	0.96	54.4	94	97	99	49	46	81	78	4	
6	24	0.34	1.09	56.7	95	98	98	44	46	81	78	4	
7	28	0.38	1.22	59.1	95	99	98	50	44	81	78	4	
8	32	0.35	1.12	61.6	95	98	100	49	40	81	77	5	
9	36	0.38	1.22	64.2	95	99	100	49	42	80	77	5	
10	40	0.40	1.28	66.8	95	98	101	47	39	80	77	5	
11	44	0.40	1.28	69.2	95	99	101	47	40	80	76	5	
12	48	0.40	1.28	71.8	95	100	101	47	40	80	76	5	STOP 1524
		—	—	74.363	—	—	—	—	—	—	—	—	
1	52	0.44	1.40	74.578	96	100	101	56	43	76	75	5	START 1541
2	56	0.42	1.34	77.3	95	99	100	44	40	78	75	5	
3	60	0.42	1.34	79.9	96	99	99	43	39	79	75	5	
4	64	0.42	1.34	82.0	95	99	98	43	39	80	75	5	
5	68	0.43	1.38	85.2	96	99	100	43	38	80	75	5	
6	72	0.43	1.38	—	96	99	100	43	38	80	75	5	
7	76	0.43	1.38	90.2	96	99	99	43	38	80	75	5	
8	80	.35	1.12	93.10	96	100	99	43	38	81	75	5	
9	84	.35	1.12	95.70	95	100	100	44	38	81	75	5	
10	88	.35	1.12	98.40	95	100	99	44	38	81	75	5	
11	92	.33	1.05	101.00	95	100	100	44	38	81	75	5	
12	96	.33	1.05	103.16	96	100	100	45	37	81	75	5	
				105.524									

Impinger Data (vol)		
#	Initial	Final
1	0	
2	100	
3	100	
4	0	
5	Silica Gel	
6		

Silica Gel Data (gm)		
#	Initial	Final
1		
2		

Moisture Gain	
	ml.
	gm
	Total

Filter Data		
#	Number	Tare
1		
2		
3		

Molecular Weight Data (%		
#	O_2	CO_2
1		
2		
3		
Avg		

VEN Carbon Bed Outlet Field Test Data

Table 1
The Chemours Company - Fayetteville Works
Vinyl Ethers North Carbon Bed
Fayetteville, North Carolina

Run Identification	Run 1	Run 2	Run 3	Average
Source ID:		Carbon Bed Inlet		
Run Date	09Mar21	09Mar21	09Mar21	
Start/Stop Time	0852-1051	1135-1331	1436-1629	
Exhaust Gas Conditions				
Temperature (deg. F)	87	97	101	**95**
Moisture (volume %)	1.1	1.1	0.7	**1.0**
Oxygen (dry volume %)	20.9	20.9	20.9	**20.9**
Carbon Dioxide (dry volume %)	0.0	0.0	0.0	**0.0**
Volumetric Flow Rate				
acfm	15,680	14,565	15,725	**15,324**
dscfm	15,348	13,996	15,043	**14,796**
HFPO - Dimer Acid				
mg/dscm	5.16E-01	2.28E-01	2.19E-01	**3.21E-01**
lb/hr	2.97E-02	1.20E-02	1.23E-02	**1.80E-02**

Field Data Summary
The Chemours Company - Fayetteville Works
Vinyl Ethers North Carbon Bed Outlet
Fayetteville, North Carolina

	Run 1							Run 2							Run 3					
Traverse Point	Stack Temp(F)	Delta P	Delta H	Tm(F) in	Tm(F) out	SQRT Delta P		Stack Temp(F)	Delta P	Delta H	Tm(F) in	Tm(F) out	SQRT Delta P		Stack Temp(F)	Delta P	Delta H	Tm(F) in	Tm(F) out	SQRT Delta P
A1	83	0.42	1.60	49	47	0.6481		95	0.21	0.78	67	68	0.4583		100	0.16	0.61	82	83	0.4000
2	84	0.42	1.60	50	48	0.6481		95	0.21	0.78	68	67	0.4583		101	0.21	0.80	82	83	0.4583
3	83	0.22	0.84	53	49	0.4690		95	0.22	0.83	69	67	0.4690		101	0.23	0.87	83	83	0.4796
4	84	0.24	0.91	56	50	0.4899		96	0.25	0.95	71	67	0.5000		101	0.24	0.91	84	82	0.4899
5	84	0.29	1.10	57	51	0.5385		96	0.25	0.95	72	67	0.5000		101	0.28	1.06	84	82	0.5292
6	85	0.32	1.22	59	53	0.5657		96	0.30	1.14	72	67	0.5477		101	0.32	1.22	84	82	0.5657
7	85	0.41	1.56	57	54	0.6403		93	0.33	1.25	73	67	0.5745		101	0.34	1.29	84	81	0.5831
8	85	0.40	1.52	63	55	0.6325		96	0.35	1.33	73	67	0.5916		101	0.41	1.56	84	80	0.6403
9	85	0.42	1.60	64	56	0.6481		96	0.37	1.41	74	67	0.6083		101	0.41	1.56	83	80	0.6403
10	86	0.42	1.60	63	58	0.6481		96	0.37	1.41	74	67	0.6083		101	0.41	1.56	83	79	0.6403
11	86	0.42	1.60	67	59	0.6481		97	0.37	1.41	74	68	0.6083		101	0.41	1.56	83	79	0.6403
12	86	0.42	1.60	68	60	0.6481		97	0.37	1.41	75	68	0.6083		101	0.41	1.56	83	79	0.6403
B1	88	0.60	2.28	70	66	0.7746		97	0.31	1.18	73	70	0.5568		102	0.38	1.33	78	77	0.6164
2	88	0.60	2.28	70	66	0.7746		98	0.31	1.18	73	70	0.5568		102	0.38	1.33	80	77	0.6164
3	88	0.55	2.09	73	67	0.7416		98	0.31	1.18	75	71	0.5568		101	0.40	1.52	81	77	0.6325
4	89	0.68	2.58	75	68	0.8246		98	0.31	1.18	76	71	0.5568		101	0.41	1.56	80	77	0.6403
5	89	0.65	2.47	76	68	0.8062		98	0.36	1.37	77	72	0.6000		101	0.58	2.20	83	78	0.7616
6	89	0.65	2.47	77	70	0.8062		98	0.55	2.09	77	71	0.7416		101	0.65	2.47	81	77	0.8062
7	89	0.59	2.24	77	70	0.7681		98	0.60	2.28	80	73	0.7746		101	0.67	2.55	82	78	0.8185
8	90	0.42	1.60	78	71	0.6481		98	0.62	2.36	79	72	0.7874		102	0.67	2.55	85	78	0.8185
9	90	0.39	1.42	78	71	0.6245		98	0.62	2.36	83	75	0.7874		102	0.60	2.28	84	78	0.7746
10	90	0.33	1.25	78	72	0.5745		98	0.49	1.87	84	75	0.7000		102	0.62	2.36	84	78	0.7874
11	90	0.31	1.18	77	72	0.5568		98	0.41	1.56	85	76	0.6403		101	0.60	2.36	85	78	0.7746
12	90	0.31	1.18	77	72	0.5568		98	0.41	1.56	86	77	0.6403		102	0.60	2.36	84	78	0.7746
						0.0000					85	77	0.0000							0.0000
						0.0000							0.0000							0.0000
						0.0000							0.0000							0.0000
						0.0000							0.0000							0.0000
						0.0000							0.0000							0.0000
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						0.0000							0.0000							0.0000
						0.0000							0.0000							0.0000
						0.0000							0.0000							0.0000
						0.0000							0.0000							0.0000
Average	87	0.44	1.66	67	61	0.6534		97	0.37	1.41	76	70	0.6013		101	0.43	1.64	83	79	0.6470

Test Data Summary and Calculations
The Chemours Company - Fayetteville Works
Vinyl Ethers North Carbon Bed Outlet
Fayetteville, North Carolina

Parameter	Run 1	Run 2	Run 3
Run Date	3/9/21	3/9/21	3/9/21
Start/Stop Time	0852-1051	1135-1331	1436-1629
Duration of Run, Minutes	96	96	96
Ave. Nozzle Diameter, inches	0.243	0.243	0.243
Pitot Calibration Factor, CF	0.84	0.84	0.84
Meter Gamma	0.991	0.991	0.991
Meter Delta H, inches of H2O	1.88	1.88	1.88
Stack Diameter, inches	36	36	36
Rectangular Width, inches	0	0	0
Rectangular Length, inches	0	0	0
Stack Area, sq.ft.	7.07	7.07	7.07
Barometric Pressure, inches of Hg	30.5	30.5	30.5
Static Pressure, inches of H2O	2.3	2	2
Dry Gas Meter Sample Volume, (VM)ft3			
Initial	967.426	33.042	95.279
Final	1032.812	94.939	161.098
Total Volume	65.386	61.599	65.68
Ave. Stack Temperature, Ts(F)	86.9	96.8	101.2
Ave. Meter Temperature, Tm(F)	64.3	73.0	81.0
Ave. Run Delta H, inches of H2O	1.66	1.41	1.64
Ave. Square Root of Delta P	0.6534	0.6013	0.6470
Moisture Data			
Volume of water collected, mls	3.6	1.8	-1.6
Silica Gel, grams	12	12.4	11.8
Total Collected, mls	15.6	14.2	10.2
ORSAT Data			
%O2	20.90	20.90	20.90
%CO2	0.0	0.0	0.0
%CO			
Calculations			
Vw(std), scf =	0.734	0.668	0.480
Vm(std), dscf =	66.789	61.849	65.007
Bws=	0.011	0.011	0.007
Md=	28.84	28.84	28.84
Ms=	28.72	28.72	28.76
Vs, ft/sec =	37.0	34.3	37.1
Qs, acfm =	15,680	14,565	15,725
Qs(std), dscfm =	15,348	13,996	15,043
Isokinetic Sampling Rate, %	99.5	101.0	98.8

Where:
An = area of the nozzle
As = area of the stack
Vw(std) = volume of water vapor in gas, standard conditions = 0.04707*Vlc
Vm(std) = vol. of gas sampled, standard conditions = 17.647 x Vm x gamma x [Pb + (dH/13.6)]/Tm(R)
Bws = water vapor in gas stream, proportion by volume = Vw(std)/(Vm(std) + Vw(std))
Md = molecular weight of stack gas, dry basis = (0.44 x%CO2) + (0.32 x%O2) + [0.28 x (%N2 + %CO)]
Ms = molecular weight of stack gas, wet basis = [Md x (1-Bws)] + (18.0 x Bws)
Vs = stack gas velocity = 85.49 x Cp x (avg. Sq.Rt. dP) x [Sq.Rt. (Ts(R))/(Ms x Ps)]
Qs = stack gas flow rate = Vs x As x 60
Qs(std) = stack gas flow rate, standard conditions = Qs x (1-Bws) x (528/(Ts(R)) x (Ps/29.92)
Isokinetic sampling rate = {(Ts(R)) x [(0.00267 x Vlc) + (Vm(std)/17.647)] x 100}/(Time x vs x Ps x An x60)

Results Summary
The Chemours Company - Fayetteville Works
Vinyl Ethers North Carbon Bed Outlet
Fayetteville, North Carolina

Parameter:		Run 1				Run 2				Run 3				Average			
	Mol. Wt.	mg	mg/dscm	ppm	lb/hr	mg	mg/dscm	ppm	lb/hr	mg	mg/dscm	ppm	lb/hr	mg	mg/dscm	ppm	lb/hr
HFPO - Dimer Acid	330	0.97633	5.16E-01	3.76E-02	2.97E-02	0.39931	2.28E-01	1.66E-02	1.20E-02	0.40345	2.19E-01	1.60E-02	1.23E-02	0.59	3.21E-01	2.34E-02	1.80E-02

Where:
Pollutant Emission Concentration:
mg= total sample collected, milligrams
mg/dscm = milligrams of pollutant per dry standard cubic meter sampled = (mg/dscf) x (35.314 cubic feet/cubic meter)
ppm = parts per million =((mg/dscm x 24.04 liters/mol)/mol.wt))

Pollutant Emission Rate:
lb/hr = pounds of pollutant emitted per hour = mg/1000/[(453.59 g/lb)/(dscf)] x dscfm x 60 min/hr

Example Calculations

The Chemours Company - Fayetteville Works
Vinyl Ethers North Carbon Bed Outlet
Fayetteville, North Carolina
Note: Values are shown for example purposes only.

Vm,a = Dry gas volume at actual conditions (acf)

Initial gas meter volume:	967.426
Final gas meter volume:	1032.812
Difference:	65.386

Vm,std = Volume of dry gas at standard conditions (dscf)

= 17.647x Vm, a x Gamma*[Pbar+(DeltaH/13.6)]/Tm(R)
= 17.647 x 0.000 x 0.991 x (30.50 + [(1.880 /13.6) / 524
= 66.789

Vl,c = Volume of water collected in impingers and silica gel (ml)

impinger catch (mls):	4
silica gel (g)	12.0
total:	15.6

Vw,std = Volume of water vapor in gas at standard conditions (cu.ft.)

= (0.04707) x (Vl,c)
= 0.04707 x 15.6
= 0.734

Bwo = Proportion by volume of water vapor in gas stream

= Vw,std/(Vw,std+Vm,std)
= 0.73 / (0.73 + 66.789)
= 0.011

Ps = Stack gas static pressure (in. Hg)

= St/13.6
= 2.30 / 13.6
= 0.169

Pa = Absolute stack gas pressure (in. Hg)

= Ps+Pbar
= 0.169 + 30.50
= 30.67

MFD = Dry mole fraction of stack gas

= 1-Bwo
= 1 - 0.011
= 0.989

Md = Dry molecular weight of stack gas (lb/lb-mol)

= (0.32 x %O2) + (0.44 x %CO2) + (0.28 x %N2)
= (0.32 x 20.90)+(0.44 x 0.00) + (0.28 x 79.10)
= 28.84

Mw = Wet molecular weight of stack gas (lb/lb-mol)

= (Md) x (MFD) + (0.18) x (Bwo*100)
= 28.84 x 0.989 + 0.18 x 1.08747
= 28.72

Example Calculations

The Chemours Company - Fayetteville Works
Vinyl Ethers North Carbon Bed Outlet
Fayetteville, North Carolina
Note: Values are shown for example purposes only.

Vs,avg = **Average stack gas velocity (fps)**
= Kp x (Cp) x (sqrt,deltaP) x sqrt((Ts + 460°R)/Mw*Pa))
= 85.48 x 0.84 x 0.65 x sqrt (0.62)
= 37.0

A **Cross sectional areas of stack (sq. ft)**
= pi/4*d^2
= 3.14159/4 x 3.00 ^2
= 7.07

Qa **Volumetric flow rate at actual conditions (acfm)**
= (60)sec/min(A)(Vs, avg)
= 60 x 7.0686 x 36.97
= 15,679

Qstd **Volumetric flow rate at standard conditions (scfm)**
= Qa x (528/Ts,avg + 460) x Pa/29.92
= 15,679 x (528 / 547) x 1.025
= 15,516

Qstd,dry **Volumetric flow rate at dry standard conditions per minute(dscfm)**
= Qstd x (1-Bwo)
= 15,516 x 0.9891
= 15,347

mg/dscm **HFPO-DA concentration**
= (mg/dscf) x 35.314 cu. ft./cu. meter
= (0.98 / 66.79) x 35.314
= 5.16E-01

lb/hr **HFPO-DA Mass Emission Rate**
= mg/1000/[(453.59 g/lb)/(dscf)] x dscfm x 60 min/hr
= 0.98 / 1,000 /[453.59) / 66.79)] x 15,348 x 60
= 2.97E-02

Sample Train Recovery Data Sheet

Client The Chemours Co. **Location** Fayetteville, NC **Source** VEN Outlet **Method** Modified 0010 **Date** 3/9/2021

Run # 1

	Final ml or gm	Initial ml or gm	Net Gain	
Impinger #1	467.4	466.6	0.8	
Impinger #2	740.4	740.2	0.2	
Impinger #3	785.2	784.8	0.4	
Impinger #4	778.8	778.2	0.6	
Impinger #5	530.4	528.8	1.6	
Impinger #6	857.4	845.4	12.0	
Impinger #7			0.0	
Impinger #8			0.0	
		Total Gain	15.6	**ml/gm**

Filter #1
Filter #2
Filter #3
Run Start Time 852
Run End Time 1051
Recovery Technician PG

Run # 2

	Final ml or gm	Initial ml or gm	Net Gain	
Impinger #1	490.8	490.0	0.8	
Impinger #2	807.6	809.2	-1.6	
Impinger #3	811.2	811.4	-0.2	
Impinger #4	775.8	774.8	1.0	
Impinger #5	509.8	508.0	1.8	
Impinger #6	863.8	851.4	12.4	
Impinger #7			0.0	
Impinger #8			0.0	
		Total Gain	14.2	**ml/gm**

Filter #1
Filter #2
Filter #3
Run Start Time 1135
Run End Time 1331
Recovery Technician PG

Run # 3

	Final ml or gm	Initial ml or gm	Net Gain	
Impinger #1	466.8	467.2	-0.4	
Impinger #2	727.4	730.4	-3.0	
Impinger #3	780.6	781.4	-0.8	
Impinger #4	782.4	781.6	0.8	
Impinger #5	532.0	530.2	1.8	
Impinger #6	869.4	857.6	11.8	
Impinger #7			0.0	
Impinger #8			0.0	
		Total Gain	10.2	**ml/gm**

Filter #1
Filter #2
Filter #3
Run Start Time 1436
Run End Time 1629
Recovery Technician PG

RAMBOLL

EPA Isokinetic Field Sheet

Methods Performed: Modified 0010

Client	The Chemours Company	Run Number	1	Pitot Number	P4-1 / TC7D
Location	Fayetteville, NC	Stack Diameter	36"	Pitot Coefficient	0.84
Source	VEN Outlet	Barometric Pres.	30.50	Stack TC I.D.	P4-1 / TC7D
Date	3/9/21	Static Pressure	-2.3	Oven Box I.D.	085
Operators	SRW	Meter Box #	5	Impinger Out I.D.	12
Start Time	0852	Meter delta H	1.88	Nozzle Size	.243
End Time	1051	Meter Gamma	.991	XAD Trap I.D.	

Leak Check Rates				
	Sample Rate in.	cfm	Pitot +	Pitot -
Initial	8	.006		
Mid	8	0.000		
Mid	4	0.006		
Final	4	0.000		

Sample Point	Sample Time (min)	Velocity Head (in. H_2O)	Orifice Setting (in. H_2O)	Meter Volume (ft^3)	Temperature Readings in Degrees Farenheit: Stack	Probe	Oven Box	Impinger	Aux	Meter Inlet	Meter Outlet	Vacuum (in. hg)	Comments/Notes
~~1~~	4	0.42	1.60	967.426	83	94	83	47	36	49	47	6	K=4.93.8
2	8	0.42	1.60	970.6	84	86	84	44	36	50	48	6	
3	12	0.22	0.84	973.9	83	84	89	44	35	53	49	5	
4	16	0.24	0.91	975.9	84	84	85	43	36	56	50	4	
5	20	0.29	1.10	977.5	84	85	85	42	36	57	51	4	
6	24	0.32	1.22	979.8	85	83	85	41	35	59	53	5	
7	28	0.41	1.56	982.0	85	85	85	41	36	57	54	5	
8	32	0.40	1.52	985.2	85	86	86	40	35	63	55	5	
9	36	0.42	1.60	987.0	85	89	90	40	35	64	56	6	
10	40	0.42	1.60	989.9	86	88	84	40	35	63	58	6	
11	44	0.42	1.60	992.8	86	88	87	40	36	67	59	6	
12	48	0.42	1.66	995.4	86	88	87	40	36	68	60	6	Stop: 0940
		~~0.60~~	~~2.28~~	998.356									Start: 1003
1	52	0.60	2.28	998.652	88	89	90	40	34	70	66	6	
2	56	0.60	2.28	1001.9	88	87	89	39	36	70	66	6	
3	60	0.55	2.09	1004.4	88	90	91	40	36	73	67	6	
4	64	0.68	2.58	1007.7	89	87	87	41	36	75	68	6	
5	68	0.65	2.47	1011.0	89	90	89	41	37	76	68	6	
6	72	0.65	2.47	1014.1	89	90	90	42	38	77	70	6	
7	76	0.54	2.24	1017.7	89	90	90	42	37	77	70	6	
8	80	0.42	1.60	1020.8	90	91	90	43	39	78	71	6	
9	84	0.39	1.42	1023.4	90	90	90	44	43	78	71	5	
10	88	0.33	1.25	1025.9	90	90	91	45	43	78	72	5	
11	92	0.31	1.18	1028.2	90	91	90	46	45	77	72	5	
12	96	0.31	1.18	1030.4	90	90	90	46	45	77	72	5	
				1032.812									1051

Impinger Data (vol)		
#	Initial	Final
1	0	
2	100	
3	100	
4	0	
5	SiGel	
6		

Silica Gel Data (gm)		
#	Initial	Final
1		
2		

Moisture Gain	
	ml.
	gm
	Total

Filter Data		
#	Number	Tare
1		
2		
3		

Molecular Weight Data (%		
#	O_2	CO_2
1		
2		
3		
Avg		

RAMBOLL

EPA Isokinetic Field Sheet

Methods Performed: Modified 0010

Client	The Chemours Company	Run Number	2	Pitot Number	P4-1 / TC 7D
Location	Fayetteville, NC	Stack Diameter	36"	Pitot Coefficient	0.84
Source	VEN Outlet	Barometric Pres.	30.50	Stack TC I.D.	P4-1/TC 7D
Date	3/9/21	Static Pressure	+2.0	Oven Box I.D.	OB5
Operators	SRW	Meter Box #	5	Impinger Out I.D.	11
Start Time	1135	Meter delta H	1.88	Nozzle Size	.243
End Time	1331	Meter Gamma	.991	XAD Trap I.D.	

Leak Check Rates	Sample Rate in.	Sample Rate cfm	Pitot +	Pitot -
Initial	8	0.000	✓	✓
Mid	8	0.000		
Mid	6	0.005		
Final	8	0.000	✓	✓

Sample Point	Sample Time (min)	Velocity Head (in. H_2O)	Orifice Setting (in. H_2O)	Meter Volume (ft^3)	Temperature Readings in Degrees Farenheit: Stack	Probe	Oven Box	Impinger	Aux	Meter Inlet	Meter Outlet	Vacuum (in. hg)	Comments/Notes
1	4	0.21	0.78	~~33.035~~ 33.042	95	96	97	58	42	67	68	3	K=3.8
2	8	0.21	0.78	35.3	95	100	101	52	57	68	67	3	Start Volume: 33.042
3	12	0.22	0.83	37.05	95	101	103	49	42	69	67	4	
4	16	0.25	0.95	39.06	96	98	102	48	42	71	67	4.5	
5	20	0.25	0.95	41.19	96	97	99	47	43	72	67	4.5	
6	24	0.30	1.14	43.37	96	97	99	47	43	72	67	5	
7	28	0.33	1.25	45.92	93	96	93	46	43	73	67	5	
8	32	0.35	1.33	48.32	96	97	97	46	43	73	67	5	
9	36	0.37	1.41	50.50	96	97	98	47	43	74	67	5	
10	40	0.37	1.41	—	96	97	97	48	43	74	67	5	
11	44	0.37	1.41	55.61	97	97	98	47	43	74	68	5	
12	48	0.37	1.41	58.28	97	97	98	48	43	75	69	5	61.163
				60.865				55	40	73	70	4	Stop: 1223
1	52	0.31	1.18	61.63	97	103	104	55	40	73	70	4	Start: 1243
2	56	0.31	1.18	63.62	98	102	102	46	40	75	71	4.5	
3	60	0.31	1.18	65.91	98	98	100	45	39	76	71	4.5	
4	64	0.31	1.18	67.95	98	98	99	45	38	77	72	4.5	
5	68	0.36	1.37	70.62	98	99	100	46	39	77	71	5	
6	72	0.55	2.09	73.30	98	98	99	46	38	80	73	6	
7	76	0.60	2.28	76.31	98	100	99	46	39	79	72	6.5	
8	80	0.62	2.36	79.80	98	98	99	46	39	83	75	7	
9	84	0.62	2.36	83.15	98	99	100	46	38	84	75	7	
10	88	0.49	1.87	86.15	98	98	99	47	39	85	76	7	
11	92	0.41	1.56	89.25	94	98	100	47	40	86	77	6	
12	96	0.41	1.56	92.05	98	100	99	46	40	85	77	6	
				94.939									1331

Impinger Data (vol)		
#	Initial	Final
1	0	
2	100	
3	100	
4	0	
5	SiGel	
6		

Silica Gel Data (gm)		
#	Initial	Final
1		
2		

Moisture Gain	
	ml.
	gm
	Total

Filter Data		
#	Number	Tare
1		
2		
3		

Molecular Weight Data (%		
#	O_2	CO_2
1		
2		
3		
Avg		

RAMBOLL

EPA Isokinetic Field Sheet

Methods Performed Modified 0010

Client	The Chemours Company	Run Number	3	Pitot Number	P4-1/TC7D
Location	Fayetteville, NC	Stack Diameter	36"	Pitot Coefficient	0.84
Source	VEN Outlet	Barometric Pres.	30.50	Stack TC I.D.	P4-1/TC7D
Date	3/9/21	Static Pressure	+2.0	Oven Box I.D.	OBS
Operators	SRW	Meter Box #	5	Impinger Out I.D.	12
Start Time	1436	Meter delta H	1.88	Nozzle Size	.243
End Time	1629	Meter Gamma	.991	XAD Trap I.D.	NA

Leak Check Rates	Sample Rate in.	Sample Rate cfm	Pitot +	Pitot -
Initial	8	0.006	✓	✓
Mid	8	0.000		
Mid	8	0.000		
Final	10	0.000	✓	✓

Sample Point	Sample Time (min)	Velocity Head (in. H_2O)	Orifice Setting (in. H_2O)	Meter Volume (ft^3)	Temperature Readings in Degrees Farenheit: Stack	Probe	Oven Box	Impinger	Aux	Meter Inlet	Meter Outlet	Vacuum (in. hg)	Comments/Notes K=3.8
1	4	0.16	0.61	95.279	100	101	100	62	53	82	83	4	
2	8	0.21	0.80	97.35	101	102	103	50	51	82	83	4	
3	12	0.23	0.87	99.09	101	102	103	48	53	83	83	4	
4	16	0.24	0.91	101.16	101	101	102	47	53	84	82	4.5	
5	20	0.28	1.06	103.30	101	101	102	48	56	84	82	4.5	
6	24	0.32	1.22	105.52	101	102	101	47	55	84	82	4.5	
7	28	0.34	1.29	107.75	101	102	102	50	54	84	81	5	
8	32	0.41	1.56	110.20	101	102	101	52	56	84	80	5	
9	36	0.41	1.56	112.92	101	102	103	52	55	83	80	5.5	
10	40	0.41	1.56	115.76	101	102	102	52	56	83	79	5.5	
11	44	0.41	1.56	118.18	101	102	103	53	56	83	79	5.5	
12	48	0.41	1.56	121.10	101	102	102	53	57	83	79	5	
x	~~52~~			123.689									Stop: 1524
1	52	0.38	1.33	123.828	102	110	102	58	51	78	77	5	Start 1541
2	56	0.38	1.33	126.15	102	107	105	53	44	80	77	5	
3	60	0.40	1.52	128.93	101	104	103	50	45	81	77	5.5	
4	64	0.41	1.56	130.55	101	103	102	51	45	80	77	5	
5	68	0.58	2.20	132.91	101	102	103	47	42	83	78	5	
6	72	0.65	2.47	136.20	101	103	102	44	45	81	77	5	
7	76	0.67	2.55	139.60	101	102	102	49	45	82	78	7	
8	80	0.67	2.55	143.15	102	102	103	47	44	85	78	7	
9	84	0.60	2.28	146.81	102	102	103	46	43	84	78	7	
10	88	0.62	2.36	151.27	102	102	102	45	41	84	78	7	
11	92	0.60	2.36	154.38	101	102	102	46	41	85	78	7	
12	96	0.60	2.36	157.48	102	102	102	45	42	84	78	7	
				161.098									1629

Impinger Data (vol) #	Initial	Final
1		
2		
3		
4		
5		
6		

Silica Gel Data (gm) #	Initial	Final
1		
2		

Moisture Gain

_____ ml.

_____ gm

_____ Total

Filter Data #	Number	Tare
1		
2		
3		

Molecular Weight Data (% #	O_2	CO_2
1		
2		
3		
Avg		

RAMBOLL

APPENDIX D
LABORATORY DATA

VEN Carbon Bed Inlet Laboratory Data

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Tel: (865)291-3000

Laboratory Job ID: 140-22280-1
Client Project/Site: VEN Carbon Bed Inlet

For:
The Chemours Company FC, LLC
c/o AECOM
Sabre Building, Suite 300
4051 Ogletown Road
Newark, Delaware 19713

Attn: Michael Aucoin

Authorized for release by:
3/31/2021 9:52:59 AM

Courtney Adkins, Project Manager II
(865)291-3019
courtney.adkins@eurofinset.com

Table of Contents

Definitions/Glossary

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Inlet

Job ID: 140-22280-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
*1	LCS/LCSD RPD exceeds control limits.
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 140-22280-1

Laboratory: Eurofins TestAmerica, Knoxville

Narrative

Job Narrative
140-22280-1

Sample Receipt

The samples were received on March 13, 2021 at 10:40 AM. The temperature of the cooler at receipt was 0.6º C.

LCMS

LC/MS/MS Sampling Train Preparation and Analysis: The sampling train components are extracted and analyzed for Per- and Polyfluorinated Alkyl Substances (PFAS) using Eurofins TestAmerica Knoxville standard operating procedures KNOX-OP-0026 and KNOX-LC-0007.

The sampling trains are prepared as four analytical fractions: The particulate filter and front half of the filter holder, nozzle and probe solvent rinses are combined for one analytical fraction. The XAD-2 resin trap and back half of the filter holder, coil condenser and connecting glassware solvent rinses are also combined as a separate analytical fraction. The condensate, impinger contents and their related glassware DI water rinses make up the third analytical fraction. The breakthrough XAD module makes up the fourth analytical fraction.

The filters and XAD components are spiked with isotope dilution internal standards and the components are extracted with methanol/ammonium hydroxide by shaking for at least 18 hours. The extracts are concentrated to 10 mL and analyzed by HPLC/MS/MS. The condensates are spiked with the isotope dilution internal standards and extracted using either Solid-Phase Extraction (SPE) or diluting the water sample for analysis. Each extract at its final volume is 80:20 methanol:water

Sample results were calculated using the following equation:

Result, ηg/sample = (on-column concentration, ηg/mL) × (nominal final volume of extract (10 mL) / 1 sample) × DF × SF

Where:
DF = Instrument dilution factor
SF = Extraction Split Factor = (final volume of extract in the initial extraction batch / initial volume of extract in the “Split” batch)
For condensate, if less than the entire sample is extracted, the fraction of sample used replaces “1 sample”

Method 537 (modified): The method blank for preparation batch 140-47849 and 140-47874 contained HFPO-DA above the reporting limit (RL). The entire sample was consumed during analysis or extraction, therefore, the data have been reported.

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: (LCS 140-47734/2-B), (LCSD 140-47734/3-B) and (MB 140-47734/1-B). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1.

Method 537 (modified): The method blank for preparation batch 140-47757 and 140-47785 contained HFPO-DA above the reporting limit (RL). The entire sample was consumed during analysis or extraction, therefore, the data have been reported.

Method 537 (modified): The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for preparation batch 140-47734 and 140-47812 and analytical batch 140-48219 recovered outside control limits for the following analyte: HFPO-DA. This analyte was biased high in the LCS/LCSD. The samples were consumed during the extraction process and therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Client Sample ID: D-1976,1977 VEN CARBON BED INLET R1 OTM-45 FH

Lab Sample ID: 140-22280-1

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	391	B	4.96	2.87	ug/Sample		03/15/21 14:51	03/27/21 20:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*92*		*25 - 150*	*03/15/21 14:51*	*03/27/21 20:10*	*1*

Client Sample ID: D-1978,1979,1981 VEN CARBON BED INLET R1 OTM-45 BH

Lab Sample ID: 140-22280-2

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	5800	*+ *1	80.0	70.0	ug/Sample		03/15/21 06:58	03/28/21 10:54	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*106*		*25 - 150*	*03/15/21 06:58*	*03/28/21 10:54*	*1*

Client Sample ID: D-1980 VEN CARBON BED INLET R1 OTM-45 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-22280-3

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.244	B	0.0862	0.0142	ug/Sample		03/17/21 15:12	03/27/21 11:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*107*		*25 - 150*	*03/17/21 15:12*	*03/27/21 11:01*	*1*

Client Sample ID: D-1982 VEN CARBON BED INLET R1 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-22280-4

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0108	*+ *1	0.00160	0.00140	ug/Sample		03/15/21 06:58	03/27/21 23:16	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*86*		*25 - 150*	*03/15/21 06:58*	*03/27/21 23:16*	*1*

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Inlet

Job ID: 140-22280-1

Client Sample ID: D-1983,1984 VEN CARBON BED INLET R2 OTM-45 FH

Lab Sample ID: 140-22280-5

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	205	B	1.99	1.15	ug/Sample		03/15/21 14:51	03/27/21 20:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*100*		*25 - 150*	*03/15/21 14:51*	*03/27/21 20:18*	*1*

Client Sample ID: D-1985,1986,1988 VEN CARBON BED INLET R2 OTM-45 BH

Lab Sample ID: 140-22280-6

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	633	*+ *1	16.0	14.0	ug/Sample		03/15/21 06:58	03/27/21 23:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*112*		*25 - 150*	*03/15/21 06:58*	*03/27/21 23:25*	*1*

Client Sample ID: D-1987 VEN CARBON BED INLET R2 OTM-45 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-22280-7

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.273	B	0.0965	0.0159	ug/Sample		03/17/21 15:12	03/27/21 11:09	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*106*		*25 - 150*	*03/17/21 15:12*	*03/27/21 11:09*	*1*

Client Sample ID: D-1989 VEN CARBON BED INLET R2 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-22280-8

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0138	*+ *1	0.00160	0.00140	ug/Sample		03/15/21 06:58	03/27/21 23:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*89*		*25 - 150*	*03/15/21 06:58*	*03/27/21 23:33*	*1*

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Inlet

Job ID: 140-22280-1

Client Sample ID: D-1990,1991 VEN CARBON BED INLET R3 OTM-45 FH

Lab Sample ID: 140-22280-9

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	107	B	1.00	0.580	ug/Sample		03/15/21 14:51	03/27/21 20:27	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	111		25 - 150	03/15/21 14:51	03/27/21 20:27	1

Client Sample ID: D-1992,1993,1995 VEN CARBON BED INLET R3 OTM-45 BH

Lab Sample ID: 140-22280-10

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	573	*+ *1	16.0	14.0	ug/Sample		03/15/21 06:58	03/27/21 23:51	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	105		25 - 150	03/15/21 06:58	03/27/21 23:51	1

Client Sample ID: D-1994 VEN CARBON BED INLET R3 OTM-45 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-22280-11

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.409	B	0.0911	0.0150	ug/Sample		03/17/21 15:12	03/27/21 11:36	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	104		25 - 150	03/17/21 15:12	03/27/21 11:36	1

Client Sample ID: D-1996 VEN CARBON BED INLET R3 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-22280-12

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0120	*+ *1	0.00160	0.00140	ug/Sample		03/15/21 06:58	03/28/21 00:00	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	58		25 - 150	03/15/21 06:58	03/28/21 00:00	1

Default Detection Limits

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Inlet

Job ID: 140-22280-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Prep: None

Analyte	RL	MDL	Units
HFPO-DA	0.00100	0.000580	ug/Sample
HFPO-DA	0.00160	0.00140	ug/Sample
HFPO-DA	0.00200	0.000330	ug/Sample

Isotope Dilution Summary

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Inlet

Job ID: 140-22280-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Air

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)						
Lab Sample ID	Client Sample ID	HFPODA (25-150)						
140-22280-1	D-1976,1977 VEN CARBON BE	92						
140-22280-2	D-1978,1979,1981 VEN CARBON BED INLET R1 OTM-45 BH	106						
140-22280-3	D-1980 VEN CARBON BED INLET R1 OTM-45 IMPINGERS 1,2&3 COND	107						
140-22280-4	D-1982 VEN CARBON BED INLET R1 OTM-45 BREAKTHROUGH XAD-2 RESI TUBE	86						
140-22280-5	D-1983,1984 VEN CARBON BED INLET R2 OTM-45 FH	100						
140-22280-6	D-1985,1986,1988 VEN CARBON BED INLET R2 OTM-45 BH	112						
140-22280-7	D-1987 VEN CARBON BED INLET R2 OTM-45 IMPINGERS 1,2&3 COND	106						
140-22280-8	D-1989 VEN CARBON BED INLET R2 OTM-45 BREAKTHROUGH XAD-2 RESI TUBE	89						
140-22280-9	D-1990,1991 VEN CARBON BED INLET R3 OTM-45 FH	111						
140-22280-10	D-1992,1993,1995 VEN CARBON BED INLET R3 OTM-45 BH	105						
140-22280-11	D-1994 VEN CARBON BED INLET R3 OTM-45 IMPINGERS 1,2&3 COND	104						
140-22280-12	D-1996 VEN CARBON BED INLET R3 OTM-45 BREAKTHROUGH XAD-2 RESI TUBE	58						
LCS 140-47734/2-B	Lab Control Sample	43						
LCS 140-47757/2-B	Lab Control Sample	88						
LCS 140-47849/2-B	Lab Control Sample	109						
LCSD 140-47734/3-B	Lab Control Sample Dup	33						
LCSD 140-47757/3-B	Lab Control Sample Dup	95						
LCSD 140-47849/3-B	Lab Control Sample Dup	108						
MB 140-47734/14-B	Method Blank	64						
MB 140-47734/1-B	Method Blank	45						
MB 140-47757/1-B	Method Blank	92						
MB 140-47849/1-B	Method Blank	101						

Surrogate Legend

HFPODA = 13C3 HFPO-DA

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 140-47734/14-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 47734

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00160	0.00140	ug/Sample		03/15/21 06:58	03/27/21 23:42	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*64*		*25 - 150*	*03/15/21 06:58*	*03/27/21 23:42*	*1*

Lab Sample ID: MB 140-47734/1-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 47734

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00160	0.00140	ug/Sample		03/15/21 06:58	03/27/21 21:20	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*45*		*25 - 150*	*03/15/21 06:58*	*03/27/21 21:20*	*1*

Lab Sample ID: LCS 140-47734/2-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 47734

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
PFOA			0.0200	0.02027		ug/Sample		101	60 - 140		
HFPO-DA			0.0200	0.02128		ug/Sample		106	60 - 140		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*43*		*25 - 150*

Lab Sample ID: LCSD 140-47734/3-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 47734

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
PFOA			0.0200	0.02152		ug/Sample		108	60 - 140	6	30
HFPO-DA			0.0200	0.03810	*+ *1	ug/Sample		190	60 - 140	57	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*33*		*25 - 150*

Lab Sample ID: MB 140-47757/1-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 47757

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.003180		0.00100	0.000580	ug/Sample		03/15/21 14:51	03/27/21 19:08	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*92*		*25 - 150*	*03/15/21 14:51*	*03/27/21 19:08*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 140-47757/2-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 47757

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
PFOA			0.0200	0.01985		ug/Sample		99	60 - 140		
HFPO-DA			0.0200	0.02453		ug/Sample		123	60 - 140		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*88*		*25 - 150*

Lab Sample ID: LCSD 140-47757/3-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 47757

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
PFOA			0.0200	0.01976		ug/Sample		99	60 - 140	0	30
HFPO-DA			0.0200	0.02526		ug/Sample		126	60 - 140	3	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*95*		*25 - 150*

Lab Sample ID: MB 140-47849/1-B
Matrix: Air
Analysis Batch: 48210

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 47849

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.001638		0.000500	0.0000825	ug/Sample		03/17/21 15:12	03/27/21 10:08	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*101*		*25 - 150*	*03/17/21 15:12*	*03/27/21 10:08*	*1*

Lab Sample ID: LCS 140-47849/2-B
Matrix: Air
Analysis Batch: 48210

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 47849

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.0100	0.01169		ug/Sample		117	60 - 140		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*109*		*25 - 150*

Lab Sample ID: LCSD 140-47849/3-B
Matrix: Air
Analysis Batch: 48210

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 47849

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			0.0100	0.01195		ug/Sample		119	60 - 140	2	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*108*		*25 - 150*

LCMS

Prep Batch: 47734

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22280-2	D-1978,1979,1981 VEN CARBON BED INLET R	Total/NA	Air	None	
140-22280-4	D-1982 VEN CARBON BED INLET R1 OTM-45 E	Total/NA	Air	None	
140-22280-6	D-1985,1986,1988 VEN CARBON BED INLET R2	Total/NA	Air	None	
140-22280-8	D-1989 VEN CARBON BED INLET R2 OTM-45 E	Total/NA	Air	None	
140-22280-10	D-1992,1993,1995 VEN CARBON BED INLET R3	Total/NA	Air	None	
140-22280-12	D-1996 VEN CARBON BED INLET R3 OTM-45 E	Total/NA	Air	None	
MB 140-47734/14-B	Method Blank	Total/NA	Air	None	
MB 140-47734/1-B	Method Blank	Total/NA	Air	None	
LCS 140-47734/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-47734/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Prep Batch: 47757

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22280-1	D-1976,1977 VEN CARBON BED INLET R1 OTM	Total/NA	Air	None	
140-22280-5	D-1983,1984 VEN CARBON BED INLET R2 OTM	Total/NA	Air	None	
140-22280-9	D-1990,1991 VEN CARBON BED INLET R3 OTM	Total/NA	Air	None	
MB 140-47757/1-B	Method Blank	Total/NA	Air	None	
LCS 140-47757/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-47757/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Cleanup Batch: 47785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22280-1	D-1976,1977 VEN CARBON BED INLET R1 OTM	Total/NA	Air	Split	47757
140-22280-5	D-1983,1984 VEN CARBON BED INLET R2 OTM	Total/NA	Air	Split	47757
140-22280-9	D-1990,1991 VEN CARBON BED INLET R3 OTM	Total/NA	Air	Split	47757
MB 140-47757/1-B	Method Blank	Total/NA	Air	Split	47757
LCS 140-47757/2-B	Lab Control Sample	Total/NA	Air	Split	47757
LCSD 140-47757/3-B	Lab Control Sample Dup	Total/NA	Air	Split	47757

Cleanup Batch: 47812

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22280-2	D-1978,1979,1981 VEN CARBON BED INLET R	Total/NA	Air	Split	47734
140-22280-4	D-1982 VEN CARBON BED INLET R1 OTM-45 E	Total/NA	Air	Split	47734
140-22280-6	D-1985,1986,1988 VEN CARBON BED INLET R2	Total/NA	Air	Split	47734
140-22280-8	D-1989 VEN CARBON BED INLET R2 OTM-45 E	Total/NA	Air	Split	47734
140-22280-10	D-1992,1993,1995 VEN CARBON BED INLET R3	Total/NA	Air	Split	47734
140-22280-12	D-1996 VEN CARBON BED INLET R3 OTM-45 E	Total/NA	Air	Split	47734
MB 140-47734/14-B	Method Blank	Total/NA	Air	Split	47734
MB 140-47734/1-B	Method Blank	Total/NA	Air	Split	47734
LCS 140-47734/2-B	Lab Control Sample	Total/NA	Air	Split	47734
LCSD 140-47734/3-B	Lab Control Sample Dup	Total/NA	Air	Split	47734

Prep Batch: 47849

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22280-3	D-1980 VEN CARBON BED INLET R1 OTM-45 II	Total/NA	Air	None	
140-22280-7	D-1987 VEN CARBON BED INLET R2 OTM-45 II	Total/NA	Air	None	
140-22280-11	D-1994 VEN CARBON BED INLET R3 OTM-45 II	Total/NA	Air	None	
MB 140-47849/1-B	Method Blank	Total/NA	Air	None	
LCS 140-47849/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-47849/3-B	Lab Control Sample Dup	Total/NA	Air	None	

QC Association Summary

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Inlet

Job ID: 140-22280-1

LCMS

Cleanup Batch: 47874

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22280-3	D-1980 VEN CARBON BED INLET R1 OTM-45 II	Total/NA	Air	Split	47849
140-22280-7	D-1987 VEN CARBON BED INLET R2 OTM-45 II	Total/NA	Air	Split	47849
140-22280-11	D-1994 VEN CARBON BED INLET R3 OTM-45 II	Total/NA	Air	Split	47849
MB 140-47849/1-B	Method Blank	Total/NA	Air	Split	47849
LCS 140-47849/2-B	Lab Control Sample	Total/NA	Air	Split	47849
LCSD 140-47849/3-B	Lab Control Sample Dup	Total/NA	Air	Split	47849

Analysis Batch: 48210

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22280-3	D-1980 VEN CARBON BED INLET R1 OTM-45 II	Total/NA	Air	537 (modified)	47874
140-22280-7	D-1987 VEN CARBON BED INLET R2 OTM-45 II	Total/NA	Air	537 (modified)	47874
140-22280-11	D-1994 VEN CARBON BED INLET R3 OTM-45 II	Total/NA	Air	537 (modified)	47874
MB 140-47849/1-B	Method Blank	Total/NA	Air	537 (modified)	47874
LCS 140-47849/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	47874
LCSD 140-47849/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	47874

Cleanup Batch: 48218

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22280-1	D-1976,1977 VEN CARBON BED INLET R1 OTM	Total/NA	Air	Dilution	47785
140-22280-2	D-1978,1979,1981 VEN CARBON BED INLET R	Total/NA	Air	Dilution	47812
140-22280-5	D-1983,1984 VEN CARBON BED INLET R2 OTM	Total/NA	Air	Dilution	47785
140-22280-6	D-1985,1986,1988 VEN CARBON BED INLET R2	Total/NA	Air	Dilution	47812
140-22280-9	D-1990,1991 VEN CARBON BED INLET R3 OTM	Total/NA	Air	Dilution	47785
140-22280-10	D-1992,1993,1995 VEN CARBON BED INLET R3	Total/NA	Air	Dilution	47812

Analysis Batch: 48219

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22280-1	D-1976,1977 VEN CARBON BED INLET R1 OTM	Total/NA	Air	537 (modified)	48218
140-22280-4	D-1982 VEN CARBON BED INLET R1 OTM-45 E	Total/NA	Air	537 (modified)	47812
140-22280-5	D-1983,1984 VEN CARBON BED INLET R2 OTM	Total/NA	Air	537 (modified)	48218
140-22280-6	D-1985,1986,1988 VEN CARBON BED INLET R2	Total/NA	Air	537 (modified)	48218
140-22280-8	D-1989 VEN CARBON BED INLET R2 OTM-45 E	Total/NA	Air	537 (modified)	47812
140-22280-9	D-1990,1991 VEN CARBON BED INLET R3 OTM	Total/NA	Air	537 (modified)	48218
140-22280-10	D-1992,1993,1995 VEN CARBON BED INLET R3	Total/NA	Air	537 (modified)	48218
140-22280-12	D-1996 VEN CARBON BED INLET R3 OTM-45 E	Total/NA	Air	537 (modified)	47812
MB 140-47734/14-B	Method Blank	Total/NA	Air	537 (modified)	47812
MB 140-47734/1-B	Method Blank	Total/NA	Air	537 (modified)	47812
MB 140-47757/1-B	Method Blank	Total/NA	Air	537 (modified)	47785
LCS 140-47734/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	47812
LCS 140-47757/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	47785
LCSD 140-47734/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	47812
LCSD 140-47757/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	47785

Analysis Batch: 48223

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22280-2	D-1978,1979,1981 VEN CARBON BED INLET R	Total/NA	Air	537 (modified)	48218

Lab Chronicle

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Inlet

Job ID: 140-22280-1

Client Sample ID: D-1976,1977 VEN CARBON BED INLET R1 OTM-45 FH

Lab Sample ID: 140-22280-1

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	111 mL	47757	03/15/21 14:51	DWS	TAL KNX
Total/NA	Cleanup	Split			56 mL	10 mL	47785	03/16/21 11:03	DWS	TAL KNX
Total/NA	Cleanup	Dilution			2 uL	10000 uL	48218	03/27/21 05:30	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 20:10	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: D-1978,1979,1981 VEN CARBON BED INLET R1 OTM-45 BH

Lab Sample ID: 140-22280-2

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Cleanup	Dilution			0.2 uL	10000 uL	48218	03/27/21 05:30	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			48223	03/28/21 10:54	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: D-1980 VEN CARBON BED INLET R1 OTM-45 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-22280-3

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.0058 Sample	10 mL	47849	03/17/21 15:12	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	47874	03/18/21 09:23	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48210	03/27/21 11:01	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: D-1982 VEN CARBON BED INLET R1 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-22280-4

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 23:16	JRC	TAL KNX
	Instrument ID: LCA									

Lab Chronicle

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Inlet

Job ID: 140-22280-1

Client Sample ID: D-1983,1984 VEN CARBON BED INLET R2 OTM-45 FH

Lab Sample ID: 140-22280-5

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	135 mL	47757	03/15/21 14:51	DWS	TAL KNX
Total/NA	Cleanup	Split			68 mL	10 mL	47785	03/16/21 11:03	DWS	TAL KNX
Total/NA	Cleanup	Dilution			5 uL	10000 uL	48218	03/27/21 05:30	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 20:18	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: D-1985,1986,1988 VEN CARBON BED INLET R2 OTM-45 BH

Lab Sample ID: 140-22280-6

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Cleanup	Dilution			1 uL	10000 uL	48218	03/27/21 05:30	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 23:25	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: D-1987 VEN CARBON BED INLET R2 OTM-45 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-22280-7

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.00518 Sample	10 mL	47849	03/17/21 15:12	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	47874	03/18/21 09:23	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48210	03/27/21 11:09	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: D-1989 VEN CARBON BED INLET R2 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-22280-8

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 23:33	JRC	TAL KNX
	Instrument ID: LCA									

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Inlet

Job ID: 140-22280-1

Client Sample ID: D-1990,1991 VEN CARBON BED INLET R3 OTM-45 FH

Lab Sample ID: 140-22280-9

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	128 mL	47757	03/15/21 14:51	DWS	TAL KNX
Total/NA	Cleanup	Split			64 mL	10 mL	47785	03/16/21 11:03	DWS	TAL KNX
Total/NA	Cleanup	Dilution			10 uL	10000 uL	48218	03/27/21 05:30	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 20:27	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: D-1992,1993,1995 VEN CARBON BED INLET R3 OTM-45 BH

Lab Sample ID: 140-22280-10

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Cleanup	Dilution			1 uL	10000 uL	48218	03/27/21 05:30	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 23:51	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: D-1994 VEN CARBON BED INLET R3 OTM-45 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-22280-11

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.00549 Sample	10 mL	47849	03/17/21 15:12	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	47874	03/18/21 09:23	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48210	03/27/21 11:36	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: D-1996 VEN CARBON BED INLET R3 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-22280-12

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/28/21 00:00	JRC	TAL KNX
	Instrument ID: LCA									

Lab Chronicle

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Inlet

Job ID: 140-22280-1

Client Sample ID: Method Blank
Lab Sample ID: MB 140-47734/14-B
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 23:42	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-47734/1-B
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 21:20	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-47757/1-B
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	47757	03/15/21 14:51	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	47785	03/16/21 11:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 19:08	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-47849/1-B
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	10 mL	47849	03/17/21 15:12	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	47874	03/18/21 09:23	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48210	03/27/21 10:08	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-47734/2-B
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 21:29	JRC	TAL KNX
	Instrument ID: LCA									

Lab Chronicle

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Inlet

Job ID: 140-22280-1

Client Sample ID: Lab Control Sample
Date Collected: N/A
Date Received: N/A

Lab Sample ID: LCS 140-47757/2-B
Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	47757	03/15/21 14:51	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	47785	03/16/21 11:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 19:17	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Lab Control Sample
Date Collected: N/A
Date Received: N/A

Lab Sample ID: LCS 140-47849/2-B
Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	10 mL	47849	03/17/21 15:12	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	47874	03/18/21 09:23	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48210	03/27/21 10:17	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Lab Control Sample Dup
Date Collected: N/A
Date Received: N/A

Lab Sample ID: LCSD 140-47734/3-B
Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 21:37	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Lab Control Sample Dup
Date Collected: N/A
Date Received: N/A

Lab Sample ID: LCSD 140-47757/3-B
Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	47757	03/15/21 14:51	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	47785	03/16/21 11:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 19:26	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Lab Control Sample Dup
Date Collected: N/A
Date Received: N/A

Lab Sample ID: LCSD 140-47849/3-B
Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	10 mL	47849	03/17/21 15:12	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	47874	03/18/21 09:23	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48210	03/27/21 10:25	JRC	TAL KNX
	Instrument ID: LCA									

Laboratory References:
TAL KNX = Eurofins TestAmerica, Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Accreditation/Certification Summary

Client: The Chemours Company FC, LLC
Job ID: 140-22280-1
Project/Site: VEN Carbon Bed Inlet

Laboratory: Eurofins TestAmerica, Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
	AFCEE	N/A	
ANAB	Dept. of Defense ELAP	L2311	02-13-22
ANAB	Dept. of Energy	L2311.01	02-13-22
ANAB	ISO/IEC 17025	L2311	02-13-22
ANAB	ISO/IEC 17025	L2311	02-14-22
Arkansas DEQ	State	88-0688	06-17-21
California	State	2423	06-30-22
Colorado	State	TN00009	02-28-21 *
Connecticut	State	PH-0223	09-30-21
Florida	NELAP	E87177	07-01-21
Georgia (DW)	State	906	12-11-22
Hawaii	State	NA	12-11-21
Kansas	NELAP	E-10349	10-31-21
Kentucky (DW)	State	90101	12-31-21
Louisiana	NELAP	83979	06-30-21
Louisiana (DW)	State	LA019	12-31-21
Maryland	State	277	03-31-22
Michigan	State	9933	12-11-22
Nevada	State	TN00009	07-31-21
New Hampshire	NELAP	299919	01-17-22
New Jersey	NELAP	TN001	07-01-21
New York	NELAP	10781	04-01-21
North Carolina (DW)	State	21705	07-31-21
North Carolina (WW/SW)	State	64	12-31-21
Ohio VAP	State	CL0059	06-02-23
Oklahoma	State	9415	08-31-21
Oregon	NELAP	TNI0189	01-01-22
Pennsylvania	NELAP	68-00576	12-31-21
Tennessee	State	02014	12-11-22
Texas	NELAP	T104704380-18-12	08-31-21
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	US Federal Programs	P330-19-00236	08-20-22
Utah	NELAP	TN00009	07-31-21
Virginia	NELAP	460176	09-14-21
Washington	State	C593	01-19-22
West Virginia (DW)	State	9955C	01-02-22
West Virginia DEP	State	345	05-01-21
Wisconsin	State	998044300	08-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Inlet

Job ID: 140-22280-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL KNX
Dilution	Dilution and Re-fortification of Standards	None	TAL KNX
None	Leaching Procedure	TAL SOP	TAL KNX
None	Leaching Procedure for Condensate	TAL SOP	TAL KNX
None	Leaching Procedure for Filter	TAL SOP	TAL KNX
Split	Source Air Split	None	TAL KNX

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

TAL KNX = Eurofins TestAmerica, Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Sample Summary

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Inlet

Job ID: 140-22280-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-22280-1	D-1976,1977 VEN CARBON BED INLET R1 OTM-45 FH	Air	03/09/21 00:00	03/13/21 10:40	
140-22280-2	D-1978,1979,1981 VEN CARBON BED INLET R OTM-45 BH	Air	03/09/21 00:00	03/13/21 10:40	
140-22280-3	D-1980 VEN CARBON BED INLET R1 OTM-45 IMPINGERS 1,2&3 COND	Air	03/09/21 00:00	03/13/21 10:40	
140-22280-4	D-1982 VEN CARBON BED INLET R1 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE	Air	03/09/21 00:00	03/13/21 10:40	
140-22280-5	D-1983,1984 VEN CARBON BED INLET R2 OTM-45 FH	Air	03/09/21 00:00	03/13/21 10:40	
140-22280-6	D-1985,1986,1988 VEN CARBON BED INLET R OTM-45 BH	Air	03/09/21 00:00	03/13/21 10:40	
140-22280-7	D-1987 VEN CARBON BED INLET R2 OTM-45 IMPINGERS 1,2&3 COND	Air	03/09/21 00:00	03/13/21 10:40	
140-22280-8	D-1989 VEN CARBON BED INLET R2 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE	Air	03/09/21 00:00	03/13/21 10:40	
140-22280-9	D-1990,1991 VEN CARBON BED INLET R3 OTM-45 FH	Air	03/09/21 00:00	03/13/21 10:40	
140-22280-10	D-1992,1993,1995 VEN CARBON BED INLET R OTM-45 BH	Air	03/09/21 00:00	03/13/21 10:40	
140-22280-11	D-1994 VEN CARBON BED INLET R3 OTM-45 IMPINGERS 1,2&3 COND	Air	03/09/21 00:00	03/13/21 10:40	
140-22280-12	D-1996 VEN CARBON BED INLET R3 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE	Air	03/09/21 00:00	03/13/21 10:40	

Project Identification:	**Chemours Emissions Test**
Client Name:	Chemours Company
Client Contact:	Christel Compton (910) 678-1213
TestAmerica Contact:	Courtney Adkins (865) 291-3019
TestAmerica Project Manager:	Billy Anderson (865) 291-3080

Analytical Testing QC Requirements:
The Legend for Project-Specific Quality Control Testing is designated in the "QC" column as follows: "BT" = Blank Train, "RB" = Reagent Blank, "MS" = Matrix Spike, "MSD" = Matrix Spike Duplicate, "DUP" = Duplicate, "PB" = Proof Blank, "TB" = Trip Blank

Laboratory Deliverable Turnaround Requirements:	
Analytical Due Date: (Review-Released Data)	21 Days from Lab Receipt
Data Package Due Date:	28 Days from Lab Receipt
Laboratory Destination:	TestAmerica Laboratories, Inc. 5815 Middlebrook Pike Knoxville, TN 37921
Lab Phone Number:	865.291.3000
Courier:	Hand Deliver

Project Deliverables:
Report analytical results on TALS Reports and in data packages. Include "Field Sample Number", "Sample Type", and "Run Number" on all TALS Reports.

Analytical Parameter:	**Holding Time Requirements:**	**Preservation Requirements:**
HFPO-DA (CAS No. 13252-13-6)	14 Days to Extraction; 40 Days to Analysis	Cool, 4°C

Field Sample No./Sample Coding ID	**Run No.**	**Sample Collection Date**	**Project QC Require -ments**	**Sample Bottle/ Container**	**Sample Type/Analysis**	**Analytical Specifications**
D-1976 VEN Carbon Bed Inlet R1 OTM-45 Particulate Filter (Combine with *D-1977*)	1	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Particulate Filter (82.6 mm Whatman Glass Microfiber)** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Front-Half Probe Rinse to assist the solvent extraction of the Particulate Filter sample. Analyze for HFPO-DA using method 8321A-HFPO.
D-1977 VEN Carbon Bed Inlet R1 OTM-45 FH of Filter Holder & Probe Methanol Rinse (Combine with *D-1976*)	1	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample in the Particulate Filter extraction.
D-1978 VEN Carbon Bed Inlet R1 OTM-45 XAD-2 Resin Tube	1	3/9/21		XAD-2 Resin Tube	**XAD-2 Resin Tube** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Back-Half Glassware Rinse and the Impinger Glassware Methanol Rinse to assist the solvent extraction of the XAD-2 resin sample. Analyze for HFPO-DA using method 8321A-HFPO.

140-22280 Chain of Custody

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Require -ments	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
D-1979 VEN Carbon Bed Inlet R1 OTM-45 BH of Filter Holder & Coil Condenser Methanol Rinse (Combine with *D-1978*)	1	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction.
D-1980 VEN Carbon Bed Inlet R1 OTM-45 Impingers 1,2 & 3 Condensate	1	3/9/21		500 mL HDPE Wide-Mouth Bottle	**Impinger #1, #2 & #3 Condensate** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Analyze the sample for HFPO-DA.
D-1981 VEN Carbon Bed Inlet R1 OTM-45 Impinger Glassware MeOH Rinse (Combine with *D-1978*)	1	3/9/21		250 mL HDPE Wide-Mouth Bottle	**Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample in the XAD-2 Resin Extraction.
D-1982 VEN Carbon Bed Inlet R1 OTM-45 Breakthrough XAD-2 Resin Tube	1	3/9/21		XAD-2 Resin Tube	**Breakthrough XAD-2 Resin Tube** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level and perform the regular XAD-2 Resin Extraction. Analyze for HFPO-DA using method 8321A-HFPO.
D-1983 VEN Carbon Bed Inlet R2 OTM-45 Particulate Filter (Combine with *D-1984*)	2	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Particulate Filter (82.6 mm Whatman Glass Microfiber)** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Front-Half Probe Rinse to assist the solvent extraction of the Particulate Filter sample. Analyze for HFPO-DA using method 8321A-HFPO.
D-1984 VEN Carbon Bed Inlet R2 OTM-45 Front Half of Filter Holder & Probe Methanol Rinse (Combine with *D-1983*)	2	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample in the Particulate Filter extraction.

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Require -ments	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
D-1985 VEN Carbon Bed Inlet R2 OTM-45 XAD-2 Resin Tube	2	3/9/21		XAD-2 Resin Tube	**XAD-2 Resin Tube** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Back-Half Glassware Rinse and the Impinger Glassware Methanol Rinse to assist the solvent extraction of the XAD-2 resin sample. Analyze for HFPO-DA using method 8321A-HFPO. Analyze.
D-1986 VEN Carbon Bed Inlet R2 OTM-45 BH of Filter Holder & Coil Condenser Methanol Rinse (Combine with *D-1985*)	2	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction.
D-1987 VEN Carbon Bed Inlet R2 OTM-45 Impingers 1,2 & 3 Condensate	2	3/9/21		500 mL HDPE Wide-Mouth Bottle	**Impinger #1, #2 & #3 Condensate** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Analyze the sample for HFPO-DA.
D-1988 VEN Carbon Bed Inlet R2 OTM-45 Impinger Glassware MeOH Rinse (Combine with *D-1985*)	2	3/9/21		250 mL HDPE Wide-Mouth Bottle	**Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample in the XAD-2 Resin Extraction.
D-1989 VEN Carbon Bed Inlet R2 OTM-45 Breakthrough XAD-2 Resin Tube	2	3/9/21		XAD-2 Resin Tube	**Breakthrough XAD-2 Resin Tube** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level and perform the regular XAD-2 Resin Extraction. Analyze for HFPO-DA using method 8321A-HFPO.

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Require-ments	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
D-1990 VEN Carbon Bed Inlet R3 OTM-45 Particulate Filter (Combine with *D-1991*)	3	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Particulate Filter (82.6 mm Whatman Glass Microfiber)** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Front-Half Probe Rinse to assist the solvent extraction of the Particulate Filter sample. Analyze for HFPO-DA using method 8321A-HFPO.
D-1991 VEN Carbon Bed Inlet R3 OTM-45 Front Half of Filter Holder & Probe Methanol Rinse (Combine with *D-1990*)	3	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample in the Particulate Filter extraction.
D-1992 VEN Carbon Bed Inlet R3 OTM-45 XAD-2 Resin Tube	3	3/9/21		XAD-2 Resin Tube	**XAD-2 Resin Tube** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Back-Half Glassware Rinse and the Impinger Glassware Methanol Rinse to assist the solvent extraction of the XAD-2 resin sample. Analyze for HFPO-DA using method 8321A-HFPO.
D-1993 VEN Carbon Bed Inlet R3 OTM-45 BH of Filter Holder & Coil Condenser Methanol Rinse (Combine with *D-1992*)	3	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction. Analyze for HFPO-DA using method 8321A-HFPO.
D-1994 VEN Carbon Bed Inlet R3 OTM-45 Impingers 1,2 & 3 Condensate	3	3/9/21		500 mL HDPE Wide-Mouth Bottle	**Impinger #1, #2 & #3 Condensate** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Analyze the sample for HFPO-DA.
D-1995 VEN Carbon Bed Inlet R3 OTM-45 Impinger Glassware MeOH Rinse (Combine with *D-1992*)	3	3/9/21		250 mL HDPE Wide-Mouth Bottle	**Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample in the XAD-2 Resin Extraction.

VEN Carbon Bed Outlet Laboratory Data

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Tel: (865)291-3000

Laboratory Job ID: 140-22278-1
Client Project/Site: VEN Carbon Bed Outlet

For:
The Chemours Company FC, LLC
c/o AECOM
Sabre Building, Suite 300
4051 Ogletown Road
Newark, Delaware 19713

Attn: Michael Aucoin

Authorized for release by:
3/31/2021 9:39:12 AM

Courtney Adkins, Project Manager II
(865)291-3019
courtney.adkins@eurofinset.com

Table of Contents

Definitions/Glossary

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Outlet

Job ID: 140-22278-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
*1	LCS/LCSD RPD exceeds control limits.
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Outlet

Job ID: 140-22278-1

Job ID: 140-22278-1

Laboratory: Eurofins TestAmerica, Knoxville

Narrative

Job Narrative
140-22278-1

Sample Receipt

The samples were received on March 13, 2021 at 10:40 AM. The temperature of the cooler at receipt was 1.4º C.

LCMS

LC/MS/MS Sampling Train Preparation and Analysis: The sampling train components are extracted and analyzed for Per- and Polyfluorinated Alkyl Substances (PFAS) using Eurofins TestAmerica Knoxville standard operating procedures KNOX-OP-0026 and KNOX-LC-0007.

The sampling trains are prepared as four analytical fractions: The particulate filter and front half of the filter holder, nozzle and probe solvent rinses are combined for one analytical fraction. The XAD-2 resin trap and back half of the filter holder, coil condenser and connecting glassware solvent rinses are also combined as a separate analytical fraction. The condensate, impinger contents and their related glassware DI water rinses make up the third analytical fraction. The breakthrough XAD module makes up the fourth analytical fraction.

The filters and XAD components are spiked with isotope dilution internal standards and the components are extracted with methanol/ammonium hydroxide by shaking for at least 18 hours. The extracts are concentrated to 10 mL and analyzed by HPLC/MS/MS. The condensates are spiked with the isotope dilution internal standards and extracted using either Solid-Phase Extraction (SPE) or diluting the water sample for analysis. Each extract at its final volume is 80:20 methanol:water

Sample results were calculated using the following equation:

Result, ηg/sample = (on-column concentration, ηg/mL) × (nominal final volume of extract (10 mL) / 1 sample) × DF × SF

Where:
DF = Instrument dilution factor
SF = Extraction Split Factor = (final volume of extract in the initial extraction batch / initial volume of extract in the “Split” batch)
For condensate, if less than the entire sample is extracted, the fraction of sample used replaces “1 sample”

Method 537 (modified): The method blank for preparation batch 140-47849 and 140-47874 contained HFPO-DA above the reporting limit (RL). The entire sample was consumed during analysis or extraction, therefore, the data have been reported. All the samples have the same level of contamination. Investigating the root cause. Checking the standards used in the preparation of the extracts.

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: (LCS 140-47734/2-B), (LCSD 140-47734/3-B) and (MB 140-47734/1-B). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1.

Method 537 (modified): The method blank for preparation batch 140-47757 and 140-47785 contained HFPO-DA above the reporting limit (RL). The entire sample was consumed during analysis or extraction, therefore, the data have been reported.

Method 537 (modified): The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for preparation batch 140-47734 and 140-47812 and analytical batch 140-48219 recovered outside control limits for HFPO-DA. The analyte was biased high in the LCS/LCSD. The samples were consumed during the extraction process and therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Outlet

Job ID: 140-22278-1

Client Sample ID: Z-2560,2561 VEN CB OUTLET R1 OTM-45 FH

Lab Sample ID: 140-22278-1

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	134	B	1.20	0.695	ug/Sample		03/15/21 14:51	03/28/21 10:46	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*103*		*25 - 150*	*03/15/21 14:51*	*03/28/21 10:46*	*1*

Client Sample ID: Z-2562,2563,2565 VEN CB OUTLET R1 OTM-45 BH

Lab Sample ID: 140-22278-2

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	842	*+ *1	16.0	14.0	ug/Sample		03/15/21 06:58	03/27/21 21:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*95*		*25 - 150*	*03/15/21 06:58*	*03/27/21 21:55*	*1*

Client Sample ID: Z-2564 VEN CB OUTLET R1 OTM-45 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-22278-3

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.278	B	0.0899	0.0148	ug/Sample		03/17/21 15:12	03/27/21 10:34	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*110*		*25 - 150*	*03/17/21 15:12*	*03/27/21 10:34*	*1*

Client Sample ID: Z-2566 VEN CB OUTLET R1 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-22278-4

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0491	*+ *1	0.00160	0.00140	ug/Sample		03/15/21 06:58	03/27/21 22:04	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*89*		*25 - 150*	*03/15/21 06:58*	*03/27/21 22:04*	*1*

Client Sample ID: Z-2567,2568 VEN CB OUTLET R2 OTM-45 FH

Lab Sample ID: 140-22278-5

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	142	B	2.00	1.16	ug/Sample		03/15/21 14:51	03/27/21 19:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*100*		*25 - 150*	*03/15/21 14:51*	*03/27/21 19:52*	*1*

Client Sample ID: Z-2569,2570,2572 VEN CB OUTLET R2 OTM-45 BH

Lab Sample ID: 140-22278-6

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	257	*+ *1	3.20	2.80	ug/Sample		03/15/21 06:58	03/27/21 22:13	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*96*		*25 - 150*	*03/15/21 06:58*	*03/27/21 22:13*	*1*

Client Sample ID: Z-2571 VEN CB OUTLET R2 OTM-45 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-22278-7

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.286	B	0.0992	0.0164	ug/Sample		03/17/21 15:12	03/27/21 10:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*106*		*25 - 150*	*03/17/21 15:12*	*03/27/21 10:43*	*1*

Client Sample ID: Z-2573 VEN CB OUTLET R2 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-22278-8

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0194	*+ *1	0.00160	0.00140	ug/Sample		03/15/21 06:58	03/27/21 22:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*88*		*25 - 150*	*03/15/21 06:58*	*03/27/21 22:39*	*1*

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Outlet

Job ID: 140-22278-1

Client Sample ID: Z-2574,2575 VEN CB OUTLET R3 OTM-45 FH

Lab Sample ID: 140-22278-9

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	159	B	1.98	1.15	ug/Sample		03/15/21 14:51	03/27/21 20:01	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*104*		*25 - 150*	*03/15/21 14:51*	*03/27/21 20:01*	*1*

Client Sample ID: Z-2576,2577,2579 VEN CB OUTLET R3 OTM-45 BH

Lab Sample ID: 140-22278-10

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	244	*+ *1	3.20	2.80	ug/Sample		03/15/21 06:58	03/27/21 22:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*105*		*25 - 150*	*03/15/21 06:58*	*03/27/21 22:49*	*1*

Client Sample ID: Z-2578 VEN CB OUTLET R3 OTM-45 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-22278-11

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.296	B	0.0865	0.0143	ug/Sample		03/17/21 15:12	03/27/21 10:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*105*		*25 - 150*	*03/17/21 15:12*	*03/27/21 10:52*	*1*

Client Sample ID: Z-2580 VEN CB OUTLET R3 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-22278-12

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.155	*+ *1	0.00160	0.00140	ug/Sample		03/15/21 06:58	03/27/21 22:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*98*		*25 - 150*	*03/15/21 06:58*	*03/27/21 22:58*	*1*

Default Detection Limits

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Outlet

Job ID: 140-22278-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Prep: None

Analyte	RL	MDL	Units
HFPO-DA	0.00100	0.000580	ug/Sample
HFPO-DA	0.00160	0.00140	ug/Sample
HFPO-DA	0.00200	0.000330	ug/Sample

Isotope Dilution Summary

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Outlet

Job ID: 140-22278-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Air

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)						
Lab Sample ID	Client Sample ID	HFPODA (25-150)						
140-22278-1	Z-2560,2561 VEN CB OUTLET I	103						
140-22278-2	Z-2562,2563,2565 VEN CB OUTLET R1 OTM-45 BH	95						
140-22278-3	Z-2564 VEN CB OUTLET R1 OTM-45 IMPINGERS 1,2&3 COND	110						
140-22278-4	Z-2566 VEN CB OUTLET R1 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE	89						
140-22278-5	Z-2567,2568 VEN CB OUTLET R2 OTM-45 FH	100						
140-22278-6	Z-2569,2570,2572 VEN CB OUTLET R2 OTM-45 BH	96						
140-22278-7	Z-2571 VEN CB OUTLET R2 OTM-45 IMPINGERS 1,2&3 COND	106						
140-22278-8	Z-2573 VEN CB OUTLET R2 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE	88						
140-22278-9	Z-2574,2575 VEN CB OUTLET R3 OTM-45 FH	104						
140-22278-10	Z-2576,2577,2579 VEN CB OUTLET R3 OTM-45 BH	105						
140-22278-11	Z-2578 VEN CB OUTLET R3 OTM-45 IMPINGERS 1,2&3 COND	105						
140-22278-12	Z-2580 VEN CB OUTLET R3 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE	98						
LCS 140-47734/2-B	Lab Control Sample	43						
LCS 140-47757/2-B	Lab Control Sample	88						
LCS 140-47849/2-B	Lab Control Sample	109						
LCSD 140-47734/3-B	Lab Control Sample Dup	33						
LCSD 140-47757/3-B	Lab Control Sample Dup	95						
LCSD 140-47849/3-B	Lab Control Sample Dup	108						
MB 140-47734/1-B	Method Blank	45						
MB 140-47757/1-B	Method Blank	92						
MB 140-47849/1-B	Method Blank	101						

Surrogate Legend

HFPODA = 13C3 HFPO-DA

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 140-47734/1-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 47734

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00160	0.00140	ug/Sample		03/15/21 06:58	03/27/21 21:20	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*45*		*25 - 150*	*03/15/21 06:58*	*03/27/21 21:20*	*1*

Lab Sample ID: LCS 140-47734/2-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 47734

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.0200	0.02128		ug/Sample		106	60 - 140		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*43*		*25 - 150*

Lab Sample ID: LCSD 140-47734/3-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 47734

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			0.0200	0.03810	*+ *1	ug/Sample		190	60 - 140	57	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*33*		*25 - 150*

Lab Sample ID: MB 140-47757/1-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 47757

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.003180		0.00100	0.000580	ug/Sample		03/15/21 14:51	03/27/21 19:08	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*92*		*25 - 150*	*03/15/21 14:51*	*03/27/21 19:08*	*1*

Lab Sample ID: LCS 140-47757/2-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 47757

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.0200	0.02453		ug/Sample		123	60 - 140		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*88*		*25 - 150*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 140-47757/3-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 47757

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			0.0200	0.02526		ug/Sample		126	60 - 140	3	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*95*		*25 - 150*

Lab Sample ID: MB 140-47849/1-B
Matrix: Air
Analysis Batch: 48210

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 47849

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.001638		0.000500	0.0000825	ug/Sample		03/17/21 15:12	03/27/21 10:08	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*101*		*25 - 150*	*03/17/21 15:12*	*03/27/21 10:08*	*1*

Lab Sample ID: LCS 140-47849/2-B
Matrix: Air
Analysis Batch: 48210

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 47849

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.0100	0.01169		ug/Sample		117	60 - 140		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*109*		*25 - 150*

Lab Sample ID: LCSD 140-47849/3-B
Matrix: Air
Analysis Batch: 48210

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 47849

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			0.0100	0.01195		ug/Sample		119	60 - 140	2	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*108*		*25 - 150*

QC Association Summary

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Outlet

Job ID: 140-22278-1

LCMS

Prep Batch: 47734

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22278-2	Z-2562,2563,2565 VEN CB OUTLET R1 OTM-45	Total/NA	Air	None	
140-22278-4	Z-2566 VEN CB OUTLET R1 OTM-45 BREAKTH	Total/NA	Air	None	
140-22278-6	Z-2569,2570,2572 VEN CB OUTLET R2 OTM-45	Total/NA	Air	None	
140-22278-8	Z-2573 VEN CB OUTLET R2 OTM-45 BREAKTH	Total/NA	Air	None	
140-22278-10	Z-2576,2577,2579 VEN CB OUTLET R3 OTM-45	Total/NA	Air	None	
140-22278-12	Z-2580 VEN CB OUTLET R3 OTM-45 BREAKTH	Total/NA	Air	None	
MB 140-47734/1-B	Method Blank	Total/NA	Air	None	
LCS 140-47734/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-47734/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Prep Batch: 47757

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22278-1	Z-2560,2561 VEN CB OUTLET R1 OTM-45 FH	Total/NA	Air	None	
140-22278-5	Z-2567,2568 VEN CB OUTLET R2 OTM-45 FH	Total/NA	Air	None	
140-22278-9	Z-2574,2575 VEN CB OUTLET R3 OTM-45 FH	Total/NA	Air	None	
MB 140-47757/1-B	Method Blank	Total/NA	Air	None	
LCS 140-47757/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-47757/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Cleanup Batch: 47785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22278-1	Z-2560,2561 VEN CB OUTLET R1 OTM-45 FH	Total/NA	Air	Split	47757
140-22278-5	Z-2567,2568 VEN CB OUTLET R2 OTM-45 FH	Total/NA	Air	Split	47757
140-22278-9	Z-2574,2575 VEN CB OUTLET R3 OTM-45 FH	Total/NA	Air	Split	47757
MB 140-47757/1-B	Method Blank	Total/NA	Air	Split	47757
LCS 140-47757/2-B	Lab Control Sample	Total/NA	Air	Split	47757
LCSD 140-47757/3-B	Lab Control Sample Dup	Total/NA	Air	Split	47757

Cleanup Batch: 47812

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22278-2	Z-2562,2563,2565 VEN CB OUTLET R1 OTM-45	Total/NA	Air	Split	47734
140-22278-4	Z-2566 VEN CB OUTLET R1 OTM-45 BREAKTH	Total/NA	Air	Split	47734
140-22278-6	Z-2569,2570,2572 VEN CB OUTLET R2 OTM-45	Total/NA	Air	Split	47734
140-22278-8	Z-2573 VEN CB OUTLET R2 OTM-45 BREAKTH	Total/NA	Air	Split	47734
140-22278-10	Z-2576,2577,2579 VEN CB OUTLET R3 OTM-45	Total/NA	Air	Split	47734
140-22278-12	Z-2580 VEN CB OUTLET R3 OTM-45 BREAKTH	Total/NA	Air	Split	47734
MB 140-47734/1-B	Method Blank	Total/NA	Air	Split	47734
LCS 140-47734/2-B	Lab Control Sample	Total/NA	Air	Split	47734
LCSD 140-47734/3-B	Lab Control Sample Dup	Total/NA	Air	Split	47734

Prep Batch: 47849

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22278-3	Z-2564 VEN CB OUTLET R1 OTM-45 IMPINGEF	Total/NA	Air	None	
140-22278-7	Z-2571 VEN CB OUTLET R2 OTM-45 IMPINGEF	Total/NA	Air	None	
140-22278-11	Z-2578 VEN CB OUTLET R3 OTM-45 IMPINGEF	Total/NA	Air	None	
MB 140-47849/1-B	Method Blank	Total/NA	Air	None	
LCS 140-47849/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-47849/3-B	Lab Control Sample Dup	Total/NA	Air	None	

QC Association Summary

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Outlet

Job ID: 140-22278-1

LCMS

Cleanup Batch: 47874

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22278-3	Z-2564 VEN CB OUTLET R1 OTM-45 IMPINGEF	Total/NA	Air	Split	47849
140-22278-7	Z-2571 VEN CB OUTLET R2 OTM-45 IMPINGEF	Total/NA	Air	Split	47849
140-22278-11	Z-2578 VEN CB OUTLET R3 OTM-45 IMPINGEF	Total/NA	Air	Split	47849
MB 140-47849/1-B	Method Blank	Total/NA	Air	Split	47849
LCS 140-47849/2-B	Lab Control Sample	Total/NA	Air	Split	47849
LCSD 140-47849/3-B	Lab Control Sample Dup	Total/NA	Air	Split	47849

Analysis Batch: 48210

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22278-3	Z-2564 VEN CB OUTLET R1 OTM-45 IMPINGEF	Total/NA	Air	537 (modified)	47874
140-22278-7	Z-2571 VEN CB OUTLET R2 OTM-45 IMPINGEF	Total/NA	Air	537 (modified)	47874
140-22278-11	Z-2578 VEN CB OUTLET R3 OTM-45 IMPINGEF	Total/NA	Air	537 (modified)	47874
MB 140-47849/1-B	Method Blank	Total/NA	Air	537 (modified)	47874
LCS 140-47849/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	47874
LCSD 140-47849/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	47874

Cleanup Batch: 48218

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22278-1	Z-2560,2561 VEN CB OUTLET R1 OTM-45 FH	Total/NA	Air	Dilution	47785
140-22278-2	Z-2562,2563,2565 VEN CB OUTLET R1 OTM-45	Total/NA	Air	Dilution	47812
140-22278-5	Z-2567,2568 VEN CB OUTLET R2 OTM-45 FH	Total/NA	Air	Dilution	47785
140-22278-6	Z-2569,2570,2572 VEN CB OUTLET R2 OTM-45	Total/NA	Air	Dilution	47812
140-22278-9	Z-2574,2575 VEN CB OUTLET R3 OTM-45 FH	Total/NA	Air	Dilution	47785
140-22278-10	Z-2576,2577,2579 VEN CB OUTLET R3 OTM-45	Total/NA	Air	Dilution	47812

Analysis Batch: 48219

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22278-2	Z-2562,2563,2565 VEN CB OUTLET R1 OTM-45	Total/NA	Air	537 (modified)	48218
140-22278-4	Z-2566 VEN CB OUTLET R1 OTM-45 BREAKTH	Total/NA	Air	537 (modified)	47812
140-22278-5	Z-2567,2568 VEN CB OUTLET R2 OTM-45 FH	Total/NA	Air	537 (modified)	48218
140-22278-6	Z-2569,2570,2572 VEN CB OUTLET R2 OTM-45	Total/NA	Air	537 (modified)	48218
140-22278-8	Z-2573 VEN CB OUTLET R2 OTM-45 BREAKTH	Total/NA	Air	537 (modified)	47812
140-22278-9	Z-2574,2575 VEN CB OUTLET R3 OTM-45 FH	Total/NA	Air	537 (modified)	48218
140-22278-10	Z-2576,2577,2579 VEN CB OUTLET R3 OTM-45	Total/NA	Air	537 (modified)	48218
140-22278-12	Z-2580 VEN CB OUTLET R3 OTM-45 BREAKTH	Total/NA	Air	537 (modified)	47812
MB 140-47734/1-B	Method Blank	Total/NA	Air	537 (modified)	47812
MB 140-47757/1-B	Method Blank	Total/NA	Air	537 (modified)	47785
LCS 140-47734/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	47812
LCS 140-47757/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	47785
LCSD 140-47734/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	47812
LCSD 140-47757/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	47785

Analysis Batch: 48223

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22278-1	Z-2560,2561 VEN CB OUTLET R1 OTM-45 FH	Total/NA	Air	537 (modified)	48218

Lab Chronicle

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Outlet

Job ID: 140-22278-1

Client Sample ID: Z-2560,2561 VEN CB OUTLET R1 OTM-45 FH

Lab Sample ID: 140-22278-1

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	115 mL	47757	03/15/21 14:51	DWS	TAL KNX
Total/NA	Cleanup	Split			48 mL	10 mL	47785	03/16/21 11:03	DWS	TAL KNX
Total/NA	Cleanup	Dilution			10 uL	10000 uL	48218	03/27/21 05:30	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			48223	03/28/21 10:46	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Z-2562,2563,2565 VEN CB OUTLET R1 OTM-45 BH

Lab Sample ID: 140-22278-2

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Cleanup	Dilution			1 uL	10000 uL	48218	03/27/21 05:30	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 21:55	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Z-2564 VEN CB OUTLET R1 OTM-45 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-22278-3

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.00556 Sample	10 mL	47849	03/17/21 15:12	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	47874	03/18/21 09:23	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48210	03/27/21 10:34	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Z-2566 VEN CB OUTLET R1 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-22278-4

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 22:04	JRC	TAL KNX
	Instrument ID: LCA									

Lab Chronicle

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Outlet

Job ID: 140-22278-1

Client Sample ID: Z-2567,2568 VEN CB OUTLET R2 OTM-45 FH

Lab Sample ID: 140-22278-5

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	126 mL	47757	03/15/21 14:51	DWS	TAL KNX
Total/NA	Cleanup	Split			63 mL	10 mL	47785	03/16/21 11:03	DWS	TAL KNX
Total/NA	Cleanup	Dilution			5 uL	10000 uL	48218	03/27/21 05:30	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 19:52	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Z-2569,2570,2572 VEN CB OUTLET R2 OTM-45 BH

Lab Sample ID: 140-22278-6

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Cleanup	Dilution			5 uL	10000 uL	48218	03/27/21 05:30	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 22:13	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Z-2571 VEN CB OUTLET R2 OTM-45 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-22278-7

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.00504 Sample	10 mL	47849	03/17/21 15:12	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	47874	03/18/21 09:23	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48210	03/27/21 10:43	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Z-2573 VEN CB OUTLET R2 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-22278-8

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 22:39	JRC	TAL KNX
	Instrument ID: LCA									

Lab Chronicle

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Outlet

Job ID: 140-22278-1

Client Sample ID: Z-2574,2575 VEN CB OUTLET R3 OTM-45 FH

Lab Sample ID: 140-22278-9

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	115 mL	47757	03/15/21 14:51	DWS	TAL KNX
Total/NA	Cleanup	Split			58 mL	10 mL	47785	03/16/21 11:03	DWS	TAL KNX
Total/NA	Cleanup	Dilution			5 uL	10000 uL	48218	03/27/21 05:30	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 20:01	JRC	TAL KNX

Instrument ID: LCA

Client Sample ID: Z-2576,2577,2579 VEN CB OUTLET R3 OTM-45 BH

Lab Sample ID: 140-22278-10

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Cleanup	Dilution			5 uL	10000 uL	48218	03/27/21 05:30	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 22:49	JRC	TAL KNX

Instrument ID: LCA

Client Sample ID: Z-2578 VEN CB OUTLET R3 OTM-45 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-22278-11

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.00578 Sample	10 mL	47849	03/17/21 15:12	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	47874	03/18/21 09:23	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48210	03/27/21 10:52	JRC	TAL KNX

Instrument ID: LCA

Client Sample ID: Z-2580 VEN CB OUTLET R3 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-22278-12

Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40

Matrix: Air

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 22:58	JRC	TAL KNX

Instrument ID: LCA

Lab Chronicle

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Outlet

Job ID: 140-22278-1

Client Sample ID: Method Blank
Lab Sample ID: MB 140-47734/1-B

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 21:20	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-47757/1-B

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	47757	03/15/21 14:51	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	47785	03/16/21 11:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 19:08	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-47849/1-B

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	10 mL	47849	03/17/21 15:12	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	47874	03/18/21 09:23	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48210	03/27/21 10:08	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-47734/2-B

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 21:29	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-47757/2-B

Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	47757	03/15/21 14:51	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	47785	03/16/21 11:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 19:17	JRC	TAL KNX
	Instrument ID: LCA									

Lab Chronicle

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Outlet

Job ID: 140-22278-1

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-47849/2-B
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	10 mL	47849	03/17/21 15:12	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	47874	03/18/21 09:23	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48210	03/27/21 10:17	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 140-47734/3-B
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	47734	03/15/21 06:58	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	47812	03/17/21 08:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 21:37	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 140-47757/3-B
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	47757	03/15/21 14:51	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	47785	03/16/21 11:03	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48219	03/27/21 19:26	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: Lab Control Sample Dup
Lab Sample ID: LCSD 140-47849/3-B
Date Collected: N/A
Matrix: Air
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	10 mL	47849	03/17/21 15:12	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	47874	03/18/21 09:23	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48210	03/27/21 10:25	JRC	TAL KNX
	Instrument ID: LCA									

Laboratory References:
TAL KNX = Eurofins TestAmerica, Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Accreditation/Certification Summary

Client: The Chemours Company FC, LLC
Job ID: 140-22278-1
Project/Site: VEN Carbon Bed Outlet

Laboratory: Eurofins TestAmerica, Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
	AFCEE	N/A	
ANAB	Dept. of Defense ELAP	L2311	02-13-22
ANAB	Dept. of Energy	L2311.01	02-13-22
ANAB	ISO/IEC 17025	L2311	02-13-22
ANAB	ISO/IEC 17025	L2311	02-14-22
Arkansas DEQ	State	88-0688	06-17-21
California	State	2423	06-30-22
Colorado	State	TN00009	02-28-21 *
Connecticut	State	PH-0223	09-30-21
Florida	NELAP	E87177	07-01-21
Georgia (DW)	State	906	12-11-22
Hawaii	State	NA	12-11-21
Kansas	NELAP	E-10349	10-31-21
Kentucky (DW)	State	90101	12-31-21
Louisiana	NELAP	83979	06-30-21
Louisiana (DW)	State	LA019	12-31-21
Maryland	State	277	03-31-22
Michigan	State	9933	12-11-22
Nevada	State	TN00009	07-31-21
New Hampshire	NELAP	299919	01-17-22
New Jersey	NELAP	TN001	07-01-21
New York	NELAP	10781	04-01-21
North Carolina (DW)	State	21705	07-31-21
North Carolina (WW/SW)	State	64	12-31-21
Ohio VAP	State	CL0059	06-02-23
Oklahoma	State	9415	08-31-21
Oregon	NELAP	TNI0189	01-01-22
Pennsylvania	NELAP	68-00576	12-31-21
Tennessee	State	02014	12-11-22
Texas	NELAP	T104704380-18-12	08-31-21
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	US Federal Programs	P330-19-00236	08-20-22
Utah	NELAP	TN00009	07-31-21
Virginia	NELAP	460176	09-14-21
Washington	State	C593	01-19-22
West Virginia (DW)	State	9955C	01-02-22
West Virginia DEP	State	345	05-01-21
Wisconsin	State	998044300	08-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Outlet

Job ID: 140-22278-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL KNX
Dilution	Dilution and Re-fortification of Standards	None	TAL KNX
None	Leaching Procedure	TAL SOP	TAL KNX
None	Leaching Procedure for Condensate	TAL SOP	TAL KNX
None	Leaching Procedure for Filter	TAL SOP	TAL KNX
Split	Source Air Split	None	TAL KNX

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

TAL KNX = Eurofins TestAmerica, Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Sample Summary

Client: The Chemours Company FC, LLC
Project/Site: VEN Carbon Bed Outlet

Job ID: 140-22278-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-22278-1	Z-2560,2561 VEN CB OUTLET R1 OTM-45 FH	Air	03/09/21 00:00	03/13/21 10:40	
140-22278-2	Z-2562,2563,2565 VEN CB OUTLET R1 OTM-45 BH	Air	03/09/21 00:00	03/13/21 10:40	
140-22278-3	Z-2564 VEN CB OUTLET R1 OTM-45 IMPINGER 1,2&3 COND	Air	03/09/21 00:00	03/13/21 10:40	
140-22278-4	Z-2566 VEN CB OUTLET R1 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE	Air	03/09/21 00:00	03/13/21 10:40	
140-22278-5	Z-2567,2568 VEN CB OUTLET R2 OTM-45 FH	Air	03/09/21 00:00	03/13/21 10:40	
140-22278-6	Z-2569,2570,2572 VEN CB OUTLET R2 OTM-45 BH	Air	03/09/21 00:00	03/13/21 10:40	
140-22278-7	Z-2571 VEN CB OUTLET R2 OTM-45 IMPINGER 1,2&3 COND	Air	03/09/21 00:00	03/13/21 10:40	
140-22278-8	Z-2573 VEN CB OUTLET R2 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE	Air	03/09/21 00:00	03/13/21 10:40	
140-22278-9	Z-2574,2575 VEN CB OUTLET R3 OTM-45 FH	Air	03/09/21 00:00	03/13/21 10:40	
140-22278-10	Z-2576,2577,2579 VEN CB OUTLET R3 OTM-45 BH	Air	03/09/21 00:00	03/13/21 10:40	
140-22278-11	Z-2578 VEN CB OUTLET R3 OTM-45 IMPINGER 1,2&3 COND	Air	03/09/21 00:00	03/13/21 10:40	
140-22278-12	Z-2580 VEN CB OUTLET R3 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE	Air	03/09/21 00:00	03/13/21 10:40	

Request for Analysis/Chain-of-Custody – RFA/COC #002
The Chemours Company – Fayetteville NC
VEN Carbon Bed Outlet

eurofins | Environment Testing TestAmerica

Project Identification:	Chemours Emissions Test
Client Name:	The Chemours Company FC, LLC
Client Contact:	Ms. Christel Compton Office: (910) 678-1213 Cell: (910) 975-3386
TestAmerica Project Manager:	Ms. Courtney Adkins Office: (865) 291-3019
TestAmerica Program Manager:	Mr. Billy Anderson Office: (865) 291-3080 Cell: (865) 206-9004

Analytical Testing QC Requirements:
The Legend for Project-Specific Quality Control Testing is designated in the "QC" column as follows: "BT" = Blank Train, "RB" = Reagent Blank, "MS" = Matrix Spike, "MSD" = Matrix Spike Duplicate, "DUP" = Duplicate, "PB" = Proof Blank, "TB" = Trip Blank

Laboratory Deliverable Turnaround Requirements:	
Analytical Due Date: (Review-Released Data)	21 Days from Lab Receipt
Data Package Due Date:	28 Days from Lab Receipt
Laboratory Destination:	Eurofins TestAmerica 5815 Middlebrook Pike Knoxville, TN
Lab Phone Number:	(865) 291-3000
Courier:	Hand Deliver

Project Deliverables:
Report analytical results on TALS Report form Std_Tal_L4. Include "Field Sample Number", "Sample Type", and "Run Number" on all TALS Reports.

Analytical Parameter:	Holding Time Requirements:	Preservation Requirements:
HFPO-DA (CAS No. 13252-13-6)	14 Days to Extraction; 40 Days to Analysis	Cool, 4°C

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Require-ments	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Z-2560 VEN CB Outlet R1 OTM-45 Filter (Combine with *Z-2561*)	1	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Particulate Filter (82.6 mm Whatman Glass Microfiber)** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Front-Half Probe Rinse to assist the solvent extraction of the Particulate Filter sample. Analyze for HFPO-DA using Method 8321A-HFPO.
Z-2561 VEN CB Outlet R1 OTM-45 FH of Filter Holder & Probe Methanol Rinse (Combine with *Z-2560*)	1	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample in the Particulate Filter extraction.
Z-2562 VEN CB Outlet R1 OTM-45 XAD-2 Resin Tube	1	3/9/21		XAD-2 Resin Tube	**XAD-2 Resin Tube** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Back-Half Glassware Rinse and the Impinger Glassware Methanol Rinse to assist the solvent extraction of the XAD-2 resin sample. Analyze for HFPO-DA using Method 8321A-HFPO.

140-22278 Chain of Custody

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Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Require -ments	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Z-2563 VEN CB Outlet R1 OTM-45 BH of Filter Holder & Coil Condenser Methanol Rinse (Combine with *Z-2562*)	1	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction. Analyze for HFPO-DA using Method 8321A-HFPO.
Z-2564 VEN CB Outlet R1 OTM-45 Impingers 1,2 & 3 Condensate	1	3/9/21		500 mL HDPE Wide-Mouth Bottle	**Impinger #1, #2 & #3 Condensate** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Analyze the sample for HFPO-DA.
Z-2565 VEN CB Outlet R1 OTM-45 Impinger Glassware MeOH Rinse (Combine with *Z-2562*)	1	3/9/21		250 mL HDPE Wide-Mouth Bottle	**Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample in the XAD-2 Resin Extraction.
Z-2566 VEN CB Outlet R1 OTM-45 Breakthrough XAD-2 Resin Tube	1	3/9/21		XAD-2 Resin Tube	**Breakthrough XAD-2 Resin Tube** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level and perform the regular XAD-2 Resin Extraction. Analyze for HFPO-DA using Method 8321A-HFPO.
Z-2567 VEN CB Outlet R2 OTM-45 Filter (Combine with *Z-2568*)	2	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Particulate Filter (82.6 mm Whatman Glass Microfiber)** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Front-Half Probe Rinse to assist the solvent extraction of the Particulate Filter sample. Analyze for HFPO-DA using Method 8321A-HFPO.
Z-2568 VEN CB Outlet R2 OTM-45 Front Half of Filter Holder & Probe Methanol Rinse (Combine with *Z-2567*)	2	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample in the Particulate Filter extraction.

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Require -ments	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Z-2569 VEN CB Outlet R2 OTM-45 XAD-2 Resin Tube	2	3/9/21		XAD-2 Resin Tube	**XAD-2 Resin Tube** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Back-Half Glassware Rinse and the Impinger Glassware Methanol Rinse to assist the solvent extraction of the XAD-2 resin sample. Analyze for HFPO-DA using Method 8321A-HFPO.
Z-2570 VEN CB Outlet R2 OTM-45 BH of Filter Holder & Coil Condenser Methanol Rinse (Combine with *Z-2569*)	2	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction. Analyze for HFPO-DA using Method 8321A-HFPO.
Z-2571 VEN CB Outlet R2 OTM-45 Impingers 1,2 & 3 Condensate	2	3/9/21		500 mL HDPE Wide-Mouth Bottle	**Impinger #1, #2 & #3 Condensate** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Analyze the sample for HFPO-DA.
Z-2572 VEN CB Outlet R2 OTM-45 Impinger Glassware MeOH Rinse (Combine with *Z-2569*)	2	3/9/21		250 mL HDPE Wide-Mouth Bottle	**Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample in the XAD-2 Resin Extraction.
Z-2573 VEN CB Outlet R2 OTM-45 Breakthrough XAD-2 Resin Tube	2	3/9/21		XAD-2 Resin Tube	**Breakthrough XAD-2 Resin Tube** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level and perform the regular XAD-2 Resin Extraction. Analyze for HFPO-DA using Method 8321A-HFPO.
Z-2574 VEN CB Outlet R3 OTM-45 Filter (Combine with *Z-2575*)	3	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Particulate Filter (82.6 mm Whatman Glass Microfiber)** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Front-Half Probe Rinse to assist the solvent extraction of the Particulate Filter sample. Analyze for HFPO-DA using Method 8321A-HFPO.

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Require -ments	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Z-2575 VEN CB Outlet R3 OTM-45 Front Half of Filter Holder & Probe Methanol Rinse (Combine with *Z-2574*)	3	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample in the Particulate Filter extraction.
Z-2576 VEN CB Outlet R3 OTM-45 XAD-2 Resin Tube	3	3/9/21		XAD-2 Resin Tube	**XAD-2 Resin Tube** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Back-Half Glassware Rinse and the Impinger Glassware Methanol Rinse to assist the solvent extraction of the XAD-2 resin sample. Analyze for HFPO-DA using Method 8321A-HFPO.
Z-2577 VEN CB Outlet R3 OTM-45 BH of Filter Holder & Coil Condenser Methanol Rinse (Combine with *Z-2576*)	3	3/9/21		125 mL HDPE Wide-Mouth Bottle	**Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction. Analyze for HFPO-DA using Method 8321A-HFPO.
Z-2578 VEN CB Outlet R3 OTM-45 Impingers 1,2 & 3 Condensate	3	3/9/21		500 mL HDPE Wide-Mouth Bottle	**Impinger #1, #2 & #3 Condensate** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Analyze the sample for HFPO-DA.
Z-2579 VEN CB Outlet R3 OTM-45 Impinger Glassware MeOH Rinse (Combine with *Z-2576*)	3	3/9/21		250 mL HDPE Wide-Mouth Bottle	**Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Use this solvent sample in the XAD-2 Resin Extraction.
Z-2580 VEN CB Outlet R3 OTM-45 Breakthrough XAD-2 Resin Tube	3	3/9/21		XAD-2 Resin Tube	**Breakthrough XAD-2 Resin Tube** OTM-45 Train HFPO-DA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level and perform the regular XAD-2 Resin Extraction. Analyze for HFPO-DA using Method 8321A-HFPO.

Sample Receipt Log and Condition of the Samples Upon Receipt:

Please fill in the following information:	Comments (Please write "NONE" if no comment applicable)
(1) Record the identities of any samples that were listed on the RFA but were not found in the sample shipment.	NONE
(2) Record the sample shipping cooler temperature of all coolers transporting samples listed on this RFA:	RT 1.7/CT 1.4°C
(3) Record any apparent sample loss/breakage.	NONE
(4) Record any unidentified samples transported with this shipment of samples:	NONE
(5) Indicate if all samples were received according to the project's required specifications (i.e. no nonconformances):	HAND DELIVERED, NO CUSTODY SEAL

Custody Transfer:

	Name	Company	Date/Time
Relinquished By:	Patrick Murphy	Kimball	3/12/21 1800
Accepted By:	Doug Cahill	ETA KNOX	3/12/21 1800
Relinquished By:	Doug Cahill	ETA KNOX	3/13/21 1040
Accepted By:	[illegible]	ETA	3/13/21 1040
Relinquished By:			
Accepted By:			
Relinquished By:			
Accepted By:			

Log: 140
22278

EUROFINS/TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST **Log In Number:**

Review Items	Yes	No	NA	If No, what was the problem?
1. Are the shipping containers intact?	/			☐ **Containers, Broken**
2. Were ambient air containers received intact?			/	☐ Checked in lab
3. The coolers/containers custody seal if present, is it intact?			/	☐ Yes ☐ NA
4. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) Thermometer ID : SC70 Correction factor: -0.3c	/			☐ **Cooler Out of Temp, Client Contacted, Proceed/Cancel** ☐ **Cooler Out of Temp, Same Day Receipt**
5. Were all of the sample containers received intact?	/			☐ **Containers, Broken**
6. Were samples received in appropriate containers?	/			☐ **Containers, Improper; Client Contacted; Proceed/Cancel**
7. Do sample container labels match COC? (IDs, Dates, Times)	/			☐ **COC & Samples Do Not Match** ☐ **COC Incorrect/Incomplete** ☐ **COC Not Received**
8. Were all of the samples listed on the COC received?	/			☐ **Sample Received, Not on COC** ☐ **Sample on COC, Not Received**
9. Is the date/time of sample collection noted?	/			☐ **COC; No Date/Time; Client Contacted**
10. Was the sampler identified on the COC?	/		/	☐ **Sampler Not Listed on COC**
11. Is the client and project name/# identified?	/			☐ **COC Incorrect/Incomplete**
12. Are tests/parameters listed for each sample?	/			☐ **COC No tests on COC**
13. Is the matrix of the samples noted?	/			☐ **COC Incorrect/Incomplete**
14. Was COC relinquished? (Signed/Dated/Timed)	/			☐ **COC Incorrect/Incomplete**
15. Were samples received within holding time?	/			☐ **Holding Time - Receipt**
16. Were samples received with correct chemical preservative (excluding Encore)?			/	☐ **pH Adjusted, pH Included (See box 16A)** ☐ **Incorrect Preservative**
17. Were VOA samples received without headspace?			/	☐ **Headspace (VOA only)**
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number:			/	☐ **Residual Chlorine**
19. For 1613B water samples is pH<9?			/	☐ If no, notify lab to adjust
20. For rad samples was sample activity info. Provided?			/	☐ Project missing info

Comments/Actions Taken

Labeling Verified by: **Date:**

pH test strip lot number:

	Box 16A: pH Preservation	Box 18A: Residual Chlorine
Preservative:		
Lot Number:		
Exp Date:		
Analyst:		
Date:		
Time:		

Project #: _____ PM Instructions: _____

Sample Receiving Associate: _____ Date: 3-13-21

QA026R32.doc, 062719

QA / QC Laboratory Data

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Tel: (865)291-3000

Laboratory Job ID: 140-22287-1
Client Project/Site: PPA Carbon Bed Field QC

For:
The Chemours Company FC, LLC
c/o AECOM
Sabre Building, Suite 300
4051 Ogletown Road
Newark, Delaware 19713

Attn: Michael Aucoin

Authorized for release by:
4/6/2021 1:21:45 PM

Courtney Adkins, Project Manager II
(865)291-3019
courtney.adkins@eurofinset.com

Table of Contents

Definitions/Glossary

Client: The Chemours Company FC, LLC
Project/Site: PPA Carbon Bed Field QC

Job ID: 140-22287-1

Qualifiers

LCMS

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 140-22287-1

Laboratory: Eurofins TestAmerica, Knoxville

Narrative

Job Narrative
140-22287-1

Receipt

The samples were received on 3/13/2021 10:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.6º C.

LCMS

LC/MS/MS Sampling Train Preparation and Analysis: The sampling train components are extracted and analyzed for Per- and Polyfluorinated Alkyl Substances (PFAS) using Eurofins TestAmerica Knoxville standard operating procedures KNOX-OP-0026 and KNOX-LC-0007.

The sampling trains are prepared as four analytical fractions: The particulate filter and front half of the filter holder, nozzle and probe solvent rinses are combined for one analytical fraction. The XAD-2 resin trap and back half of the filter holder, coil condenser and connecting glassware solvent rinses are also combined as a separate analytical fraction. The condensate, impinger contents and their related glassware DI water rinses make up the third analytical fraction. The breakthrough XAD module makes up the fourth analytical fraction.

The filters and XAD components are spiked with isotope dilution internal standards and the components are extracted with methanol/ammonium hydroxide by shaking for at least 18 hours. The extracts are concentrated to 10 mL and analyzed by HPLC/MS/MS. The condensates are spiked with the isotope dilution internal standards and extracted using either Solid-Phase Extraction (SPE) or diluting the water sample for analysis. Each extract at its final volume is 80:20 methanol:water

Sample results were calculated using the following equation:

Result, ηg/sample = (on-column concentration, ηg/mL) × (nominal final volume of extract (10 mL) / 1 sample) × DF × SF

Where:
DF = Instrument dilution factor
SF = Extraction Split Factor = (final volume of extract in the initial extraction batch / initial volume of extract in the “Split” batch)
For condensate, if less than the entire sample is extracted, the fraction of sample used replaces “1 sample”

Method 537 (modified): The method blank for preparation batch 140-48003 and 140-48146 contained HFPO-DA above the reporting limit (RL). The entire sample was consumed during analysis or extraction, therefore, the data have been reported.

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit: (LCS 140-47984/2-B). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1.

Method 537 (modified): The method blank for preparation batch 140-47984 and 140-48079 HFPO-DA above the reporting limit (RL). The entire sample was consumed during analysis or extraction, therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: The Chemours Company FC, LLC
Project/Site: PPA Carbon Bed Field QC

Job ID: 140-22287-1

Client Sample ID: T-1108,1109 QC OTM-45 PPA CB FH BT — Lab Sample ID: 140-22287-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.00386	B	0.00100	0.000580	ug/Sample	1		537 (modified)	Total/NA

Client Sample ID: T-1110,1111,1113 QC OTM-45 PPA CB BH BT — Lab Sample ID: 140-22287-2

No Detections.

Client Sample ID: T-1112 QC OTM-45 PPA CB IMPINGER 1,2&3 COND BT — Lab Sample ID: 140-22287-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.00133	B	0.000500	0.0000825	ug/Sample	1		537 (modified)	Total/NA

Client Sample ID: T-1114 QC OTM-45 PPA CB BREAKTHROUGH XAD-2 RESIN TUBE BT — Lab Sample ID: 140-22287-4

No Detections.

Client Sample ID: T-1115 QC OTM-45 PPA CB DI WATER RB — Lab Sample ID: 140-22287-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.00121	B	0.000500	0.0000825	ug/Sample	1		537 (modified)	Total/NA

Client Sample ID: T-1116 QC OTM-45 PPA CB MEOH WITH 5% NH4OH RB — Lab Sample ID: 140-22287-6

No Detections.

Client Sample ID: T-1117 QC OTM-45 PPA CB COMBINED GLASSWARE RINSES (MEOH/5% NH4OH) PB — Lab Sample ID: 140-22287-7

No Detections.

Client Sample ID: A-7359 MEDIA CHECK XAD — Lab Sample ID: 140-22287-8

No Detections.

Client Sample ID: A-7360 MEDIA CHECK FILTER — Lab Sample ID: 140-22287-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.00267	B	0.00100	0.000580	ug/Sample	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: T-1108,1109 QC OTM-45 PPA CB FH BT

Lab Sample ID: 140-22287-1
Matrix: Air
Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.00386	B	0.00100	0.000580	ug/Sample		03/22/21 14:10	03/28/21 11:13	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*96*		*25 - 150*	*03/22/21 14:10*	*03/28/21 11:13*	*1*

Client Sample ID: T-1110,1111,1113 QC OTM-45 PPA CB BH BT

Lab Sample ID: 140-22287-2
Matrix: Air
Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00160	0.00140	ug/Sample		03/23/21 14:37	04/01/21 21:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*80*		*25 - 150*	*03/23/21 14:37*	*04/01/21 21:44*	*1*

Client Sample ID: T-1112 QC OTM-45 PPA CB IMPINGER 1,2&3 COND BT

Lab Sample ID: 140-22287-3
Matrix: Air
Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.00133	B	0.000500	0.0000825	ug/Sample		03/23/21 05:53	03/27/21 14:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*108*		*25 - 150*	*03/23/21 05:53*	*03/27/21 14:23*	*1*

Client Sample ID: T-1114 QC OTM-45 PPA CB BREAKTHROUGH XAD-2 RESIN TUBE BT

Lab Sample ID: 140-22287-4
Matrix: Air
Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00160	0.00140	ug/Sample		03/23/21 14:37	04/01/21 21:53	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*76*		*25 - 150*	*03/23/21 14:37*	*04/01/21 21:53*	*1*

Client Sample ID: T-1115 QC OTM-45 PPA CB DI WATER RB

Lab Sample ID: 140-22287-5
Matrix: Air
Date Collected: 03/09/21 00:00
Date Received: 03/13/21 10:40
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.00121	B	0.000500	0.0000825	ug/Sample		03/23/21 05:53	03/27/21 14:32	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*111*		*25 - 150*	*03/23/21 05:53*	*03/27/21 14:32*	*1*

Client Sample ID: T-1116 QC OTM-45 PPA CB MEOH WITH 5% NH4OH RB

Lab Sample ID: 140-22287-6

Date Collected: 03/09/21 00:00
Matrix: Air
Date Received: 03/13/21 10:40
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00160	0.00140	ug/Sample		03/23/21 14:37	04/01/21 22:02	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*91*		*25 - 150*	*03/23/21 14:37*	*04/01/21 22:02*	*1*

Client Sample ID: T-1117 QC OTM-45 PPA CB COMBINED GLASSWARE RINSES (MEOH/5% NH4OH) PB

Lab Sample ID: 140-22287-7

Date Collected: 03/09/21 00:00
Matrix: Air
Date Received: 03/13/21 10:40
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00160	0.00140	ug/Sample		03/23/21 14:37	04/01/21 22:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*87*		*25 - 150*	*03/23/21 14:37*	*04/01/21 22:11*	*1*

Client Sample ID: A-7359 MEDIA CHECK XAD

Lab Sample ID: 140-22287-8

Date Collected: 03/09/21 00:00
Matrix: Air
Date Received: 03/13/21 10:40
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00160	0.00140	ug/Sample		03/23/21 14:37	04/01/21 22:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*74*		*25 - 150*	*03/23/21 14:37*	*04/01/21 22:37*	*1*

Client Sample ID: A-7360 MEDIA CHECK FILTER

Lab Sample ID: 140-22287-9

Date Collected: 03/09/21 00:00
Matrix: Air
Date Received: 03/13/21 10:40
Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	**0.00267**	**B**	0.00100	0.000580	ug/Sample		03/22/21 14:10	03/28/21 11:22	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*83*		*25 - 150*	*03/22/21 14:10*	*03/28/21 11:22*	*1*

Isotope Dilution Summary

Client: The Chemours Company FC, LLC
Project/Site: PPA Carbon Bed Field QC

Job ID: 140-22287-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Air

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)						
Lab Sample ID	Client Sample ID	HFPODA (25-150)						
140-22287-1	T-1108,1109 QC OTM-45 PPA C	96						
140-22287-2	T-1110,1111,1113 QC OTM-45 PPA CB BH BT	80						
140-22287-3	T-1112 QC OTM-45 PPA CB IMPINGER 1,2&3 COND BT	108						
140-22287-4	T-1114 QC OTM-45 PPA CB BREAKTHROUGH XAD-2 RESI TUBE BT	76						
140-22287-5	T-1115 QC OTM-45 PPA CB DI WATER RB	111						
140-22287-6	T-1116 QC OTM-45 PPA CB MEOH WITH 5% NH4OH RB	91						
140-22287-7	T-1117 QC OTM-45 PPA CB COMBINED GLASSWARE RINSES (MEOH/5% NH4OH) PI	87						
140-22287-8	A-7359 MEDIA CHECK XAD	74						
140-22287-9	A-7360 MEDIA CHECK FILTER	83						
LCS 140-47984/2-B	Lab Control Sample	32						
LCS 140-48003/2-B	Lab Control Sample	112						
LCS 140-48051/2-B	Lab Control Sample	76						
LCSD 140-47984/3-B	Lab Control Sample Dup	96						
LCSD 140-48003/3-B	Lab Control Sample Dup	107						
LCSD 140-48051/3-B	Lab Control Sample Dup	78						
MB 140-47984/14-B	Method Blank	76						
MB 140-47984/1-B	Method Blank	92						
MB 140-48003/14-B	Method Blank	102						
MB 140-48003/1-B	Method Blank	112						
MB 140-48051/1-B	Method Blank	93						

Surrogate Legend

HFPODA = 13C3 HFPO-DA

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 140-47984/14-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 47984

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.002612		0.00100	0.000580	ug/Sample		03/22/21 14:10	03/28/21 03:40	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*76*		*25 - 150*	*03/22/21 14:10*	*03/28/21 03:40*	*1*

Lab Sample ID: MB 140-47984/1-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 47984

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.002562		0.00100	0.000580	ug/Sample		03/22/21 14:10	03/28/21 01:28	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*92*		*25 - 150*	*03/22/21 14:10*	*03/28/21 01:28*	*1*

Lab Sample ID: LCS 140-47984/2-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 47984

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.0200	0.02413		ug/Sample		121	60 - 140		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*32*		*25 - 150*

Lab Sample ID: LCSD 140-47984/3-B
Matrix: Air
Analysis Batch: 48219

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 47984

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			0.0200	0.02295		ug/Sample		115	60 - 140	5	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*96*		*25 - 150*

Lab Sample ID: MB 140-48003/14-B
Matrix: Air
Analysis Batch: 48210

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 48003

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.001372		0.000500	0.0000825	ug/Sample		03/23/21 05:53	03/27/21 13:57	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*102*		*25 - 150*	*03/23/21 05:53*	*03/27/21 13:57*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 140-48003/1-B
Matrix: Air
Analysis Batch: 48210

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 48003

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.001514		0.000500	0.0000825	ug/Sample		03/23/21 05:53	03/27/21 11:45	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*112*		*25 - 150*	*03/23/21 05:53*	*03/27/21 11:45*	*1*

Lab Sample ID: LCS 140-48003/2-B
Matrix: Air
Analysis Batch: 48210

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 48003

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.0100	0.01114		ug/Sample		111	60 - 140		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*112*		*25 - 150*

Lab Sample ID: LCSD 140-48003/3-B
Matrix: Air
Analysis Batch: 48210

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 48003

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			0.0100	0.01177		ug/Sample		118	60 - 140	6	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*107*		*25 - 150*

Lab Sample ID: MB 140-48051/1-B
Matrix: Air
Analysis Batch: 48419

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 48051

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00160	0.00140	ug/Sample		03/23/21 14:37	04/01/21 21:18	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*93*		*25 - 150*	*03/23/21 14:37*	*04/01/21 21:18*	*1*

Lab Sample ID: LCS 140-48051/2-B
Matrix: Air
Analysis Batch: 48419

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 48051

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA			0.0200	0.02171		ug/Sample		109	60 - 140		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C3 HFPO-DA	*76*		*25 - 150*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 140-48051/3-B
Matrix: Air
Analysis Batch: 48419

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 48051

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA			0.0200	0.02091		ug/Sample		105	60 - 140	4	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C3 HFPO-DA	*78*		*25 - 150*

QC Association Summary

Client: The Chemours Company FC, LLC
Project/Site: PPA Carbon Bed Field QC

Job ID: 140-22287-1

LCMS

Prep Batch: 47984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22287-1	T-1108,1109 QC OTM-45 PPA CB FH BT	Total/NA	Air	None	
140-22287-9	A-7360 MEDIA CHECK FILTER	Total/NA	Air	None	
MB 140-47984/14-B	Method Blank	Total/NA	Air	None	
MB 140-47984/1-B	Method Blank	Total/NA	Air	None	
LCS 140-47984/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-47984/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Prep Batch: 48003

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22287-3	T-1112 QC OTM-45 PPA CB IMPINGER 1,2&3 C	Total/NA	Air	None	
140-22287-5	T-1115 QC OTM-45 PPA CB DI WATER RB	Total/NA	Air	None	
MB 140-48003/14-B	Method Blank	Total/NA	Air	None	
MB 140-48003/1-B	Method Blank	Total/NA	Air	None	
LCS 140-48003/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-48003/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Prep Batch: 48051

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22287-2	T-1110,1111,1113 QC OTM-45 PPA CB BH BT	Total/NA	Air	None	
140-22287-4	T-1114 QC OTM-45 PPA CB BREAKTHROUGH	Total/NA	Air	None	
140-22287-6	T-1116 QC OTM-45 PPA CB MEOH WITH 5% NH	Total/NA	Air	None	
140-22287-7	T-1117 QC OTM-45 PPA CB COMBINED GLASS	Total/NA	Air	None	
140-22287-8	A-7359 MEDIA CHECK XAD	Total/NA	Air	None	
MB 140-48051/1-B	Method Blank	Total/NA	Air	None	
LCS 140-48051/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-48051/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Cleanup Batch: 48079

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22287-1	T-1108,1109 QC OTM-45 PPA CB FH BT	Total/NA	Air	Split	47984
140-22287-9	A-7360 MEDIA CHECK FILTER	Total/NA	Air	Split	47984
MB 140-47984/14-B	Method Blank	Total/NA	Air	Split	47984
MB 140-47984/1-B	Method Blank	Total/NA	Air	Split	47984
LCS 140-47984/2-B	Lab Control Sample	Total/NA	Air	Split	47984
LCSD 140-47984/3-B	Lab Control Sample Dup	Total/NA	Air	Split	47984

Cleanup Batch: 48146

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22287-3	T-1112 QC OTM-45 PPA CB IMPINGER 1,2&3 C	Total/NA	Air	Split	48003
140-22287-5	T-1115 QC OTM-45 PPA CB DI WATER RB	Total/NA	Air	Split	48003
MB 140-48003/14-B	Method Blank	Total/NA	Air	Split	48003
MB 140-48003/1-B	Method Blank	Total/NA	Air	Split	48003
LCS 140-48003/2-B	Lab Control Sample	Total/NA	Air	Split	48003
LCSD 140-48003/3-B	Lab Control Sample Dup	Total/NA	Air	Split	48003

Analysis Batch: 48210

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22287-3	T-1112 QC OTM-45 PPA CB IMPINGER 1,2&3 C	Total/NA	Air	537 (modified)	48146
140-22287-5	T-1115 QC OTM-45 PPA CB DI WATER RB	Total/NA	Air	537 (modified)	48146
MB 140-48003/14-B	Method Blank	Total/NA	Air	537 (modified)	48146
MB 140-48003/1-B	Method Blank	Total/NA	Air	537 (modified)	48146

LCMS (Continued)

Analysis Batch: 48210 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 140-48003/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	48146
LCSD 140-48003/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	48146

Analysis Batch: 48219

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 140-47984/14-B	Method Blank	Total/NA	Air	537 (modified)	48079
MB 140-47984/1-B	Method Blank	Total/NA	Air	537 (modified)	48079
LCS 140-47984/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	48079
LCSD 140-47984/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	48079

Analysis Batch: 48223

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22287-1	T-1108,1109 QC OTM-45 PPA CB FH BT	Total/NA	Air	537 (modified)	48079
140-22287-9	A-7360 MEDIA CHECK FILTER	Total/NA	Air	537 (modified)	48079

Cleanup Batch: 48224

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22287-2	T-1110,1111,1113 QC OTM-45 PPA CB BH BT	Total/NA	Air	Split	48051
140-22287-4	T-1114 QC OTM-45 PPA CB BREAKTHROUGH)	Total/NA	Air	Split	48051
140-22287-6	T-1116 QC OTM-45 PPA CB MEOH WITH 5% NH	Total/NA	Air	Split	48051
140-22287-7	T-1117 QC OTM-45 PPA CB COMBINED GLASS	Total/NA	Air	Split	48051
140-22287-8	A-7359 MEDIA CHECK XAD	Total/NA	Air	Split	48051
MB 140-48051/1-B	Method Blank	Total/NA	Air	Split	48051
LCS 140-48051/2-B	Lab Control Sample	Total/NA	Air	Split	48051
LCSD 140-48051/3-B	Lab Control Sample Dup	Total/NA	Air	Split	48051

Analysis Batch: 48419

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-22287-2	T-1110,1111,1113 QC OTM-45 PPA CB BH BT	Total/NA	Air	537 (modified)	48224
140-22287-4	T-1114 QC OTM-45 PPA CB BREAKTHROUGH)	Total/NA	Air	537 (modified)	48224
140-22287-6	T-1116 QC OTM-45 PPA CB MEOH WITH 5% NH	Total/NA	Air	537 (modified)	48224
140-22287-7	T-1117 QC OTM-45 PPA CB COMBINED GLASS	Total/NA	Air	537 (modified)	48224
140-22287-8	A-7359 MEDIA CHECK XAD	Total/NA	Air	537 (modified)	48224
MB 140-48051/1-B	Method Blank	Total/NA	Air	537 (modified)	48224
LCS 140-48051/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	48224
LCSD 140-48051/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	48224

Lab Chronicle

Client: The Chemours Company FC, LLC
Project/Site: PPA Carbon Bed Field QC

Job ID: 140-22287-1

Client Sample ID: T-1108,1109 QC OTM-45 PPA CB FH BT

Lab Sample ID: 140-22287-1
Date Collected: 03/09/21 00:00
Matrix: Air
Date Received: 03/13/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	47984	03/22/21 14:10	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	48079	03/24/21 09:23	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48223	03/28/21 11:13	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: T-1110,1111,1113 QC OTM-45 PPA CB BH BT

Lab Sample ID: 140-22287-2
Date Collected: 03/09/21 00:00
Matrix: Air
Date Received: 03/13/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	48051	03/23/21 14:37	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	48224	03/28/21 10:17	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48419	04/01/21 21:44	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: T-1112 QC OTM-45 PPA CB IMPINGER 1,2&3 COND BT

Lab Sample ID: 140-22287-3
Date Collected: 03/09/21 00:00
Matrix: Air
Date Received: 03/13/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	10 mL	48003	03/23/21 05:53	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	48146	03/25/21 13:57	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48210	03/27/21 14:23	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: T-1114 QC OTM-45 PPA CB BREAKTHROUGH XAD-2 RESIN TUBE BT

Lab Sample ID: 140-22287-4
Date Collected: 03/09/21 00:00
Matrix: Air
Date Received: 03/13/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	48051	03/23/21 14:37	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	48224	03/28/21 10:17	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48419	04/01/21 21:53	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: T-1115 QC OTM-45 PPA CB DI WATER RB

Lab Sample ID: 140-22287-5
Date Collected: 03/09/21 00:00
Matrix: Air
Date Received: 03/13/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	10 mL	48003	03/23/21 05:53	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	48146	03/25/21 13:57	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48210	03/27/21 14:32	JRC	TAL KNX
	Instrument ID: LCA									

Lab Chronicle

Client: The Chemours Company FC, LLC
Project/Site: PPA Carbon Bed Field QC

Job ID: 140-22287-1

Client Sample ID: T-1116 QC OTM-45 PPA CB MEOH WITH 5% NH4OH RB

Lab Sample ID: 140-22287-6

Date Collected: 03/09/21 00:00
Matrix: Air
Date Received: 03/13/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	48051	03/23/21 14:37	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	48224	03/28/21 10:17	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48419	04/01/21 22:02	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: T-1117 QC OTM-45 PPA CB COMBINED GLASSWARE RINSES (MEOH/5% NH4OH) PB

Lab Sample ID: 140-22287-7

Date Collected: 03/09/21 00:00
Matrix: Air
Date Received: 03/13/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	48051	03/23/21 14:37	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	48224	03/28/21 10:17	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48419	04/01/21 22:11	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: A-7359 MEDIA CHECK XAD

Lab Sample ID: 140-22287-8

Date Collected: 03/09/21 00:00
Matrix: Air
Date Received: 03/13/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	48051	03/23/21 14:37	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	48224	03/28/21 10:17	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48419	04/01/21 22:37	JRC	TAL KNX
	Instrument ID: LCA									

Client Sample ID: A-7360 MEDIA CHECK FILTER

Lab Sample ID: 140-22287-9

Date Collected: 03/09/21 00:00
Matrix: Air
Date Received: 03/13/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	47984	03/22/21 14:10	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	48079	03/24/21 09:23	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			48223	03/28/21 11:22	JRC	TAL KNX
	Instrument ID: LCA									

Laboratory References:

TAL KNX = Eurofins TestAmerica, Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Accreditation/Certification Summary

Client: The Chemours Company FC, LLC
Job ID: 140-22287-1
Project/Site: PPA Carbon Bed Field QC

Laboratory: Eurofins TestAmerica, Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
	AFCEE	N/A	
ANAB	Dept. of Defense ELAP	L2311	02-13-22
ANAB	Dept. of Energy	L2311.01	02-13-22
ANAB	ISO/IEC 17025	L2311	02-13-22
ANAB	ISO/IEC 17025	L2311	02-14-22
Arkansas DEQ	State	88-0688	06-17-21
California	State	2423	06-30-22
Colorado	State	TN00009	02-28-21 *
Connecticut	State	PH-0223	09-30-21
Florida	NELAP	E87177	07-01-21
Georgia (DW)	State	906	12-11-22
Hawaii	State	NA	12-11-21
Kansas	NELAP	E-10349	10-31-21
Kentucky (DW)	State	90101	12-31-21
Louisiana	NELAP	83979	06-30-21
Louisiana (DW)	State	LA019	12-31-21
Maryland	State	277	03-31-22
Michigan	State	9933	12-11-22
Nevada	State	TN00009	07-31-21
New Hampshire	NELAP	299919	01-17-22
New Jersey	NELAP	TN001	07-01-21
New York	NELAP	10781	03-31-22
North Carolina (DW)	State	21705	07-31-21
North Carolina (WW/SW)	State	64	12-31-21
Ohio VAP	State	CL0059	06-02-23
Oklahoma	State	9415	08-31-21
Oregon	NELAP	TNI0189	01-01-22
Pennsylvania	NELAP	68-00576	12-31-21
Tennessee	State	02014	12-11-22
Texas	NELAP	T104704380-18-12	08-31-21
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	US Federal Programs	P330-19-00236	08-20-22
Utah	NELAP	TN00009	07-31-21
Virginia	NELAP	460176	09-14-21
Washington	State	C593	01-19-22
West Virginia (DW)	State	9955C	01-02-22
West Virginia DEP	State	345	05-01-21
Wisconsin	State	998044300	08-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: The Chemours Company FC, LLC
Project/Site: PPA Carbon Bed Field QC

Job ID: 140-22287-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL KNX
None	Leaching Procedure	TAL SOP	TAL KNX
None	Leaching Procedure for Condensate	TAL SOP	TAL KNX
None	Leaching Procedure for Filter	TAL SOP	TAL KNX
Split	Source Air Split	None	TAL KNX

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

TAL KNX = Eurofins TestAmerica, Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Sample Summary

Client: The Chemours Company FC, LLC
Project/Site: PPA Carbon Bed Field QC

Job ID: 140-22287-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-22287-1	T-1108,1109 QC OTM-45 PPA CB FH BT	Air	03/09/21 00:00	03/13/21 10:40	
140-22287-2	T-1110,1111,1113 QC OTM-45 PPA CB BH BT	Air	03/09/21 00:00	03/13/21 10:40	
140-22287-3	T-1112 QC OTM-45 PPA CB IMPINGER 1,2&3 COND BT	Air	03/09/21 00:00	03/13/21 10:40	
140-22287-4	T-1114 QC OTM-45 PPA CB BREAKTHROUGH XAD-2 RESIN TUBE BT	Air	03/09/21 00:00	03/13/21 10:40	
140-22287-5	T-1115 QC OTM-45 PPA CB DI WATER RB	Air	03/09/21 00:00	03/13/21 10:40	
140-22287-6	T-1116 QC OTM-45 PPA CB MEOH WITH 5% NH4OH RB	Air	03/09/21 00:00	03/13/21 10:40	
140-22287-7	T-1117 QC OTM-45 PPA CB COMBINED GLASSWARE RINSES (MEOH/5% NH4OH) PB	Air	03/09/21 00:00	03/13/21 10:40	
140-22287-8	A-7359 MEDIA CHECK XAD	Air	03/09/21 00:00	03/13/21 10:40	
140-22287-9	A-7360 MEDIA CHECK FILTER	Air	03/09/21 00:00	03/13/21 10:40	

Request for Analysis/Chain-of-Custody – RFA/COC #007
The Chemours Company – Fayetteville NC
PPA Carbon Bed Field QC Samples

Project Identification:	Chemours Emissions Test
Client Name:	The Chemours Company FC, LLC
Client Contact:	Christel Compton Office: (910) 678-1213 Cell: (910) 975-3386
TestAmerica Project Manager:	Courtney Adkins Office: (865) 291-3019
TestAmerica Program Manager:	Billy Anderson Office: (865) 291-3080 Cell: (865) 206-9004

Analytical Testing QC Requirements:
The Legend for Project-Specific Quality Control Testing is designated in the "QC" column as follows: "BT" = Blank Train, "RB" = Reagent Blank, "MS" = Matrix Spike, "MSD" = Matrix Spike Duplicate, "DUP" = Duplicate, "PB" = Proof Blank, "TB" = Trip Blank

Laboratory Deliverable Turnaround Requirements:	
Analytical Due Date: (Review-Released Data)	21 Days from Lab Receipt
Data Package Due Date:	28 Days from Lab Receipt

Laboratory Destination:	Eurofins TestAmerica 5815 Middlebrook Pike Knoxville, TN 37921
Lab Phone Number:	865.291.3000
Courier:	Hand Deliver

Project Deliverables:
Report analytical results on TALS Report form Std_Tal_L4. Include "Field Sample Number", "Sample Type", and "Run Number" on all TALS Reports.

Analytical Parameter:	Holding Time Requirements:	Preservation Requirements:
HFPO-DA (CAS No. 13252-13-6) & PFOA (CAS No. 335-67-1)	14 Days to Extraction; 40 Days to Analysis	Cool, 4°C

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Require-ments	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
T-1108 QC OTM-45 PPA CB Filter BT (Combine with *T-1109*)	QC	3/9/21	Blank Train	250 mL HDPE Wide-Mouth Bottle	**Particulate Filter (82.6 mm Whatman Glass Microfiber)** OTM-45 Blank Train HFPO-DA & PFOA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Front-Half Probe Rinse to assist the solvent extraction of the Filter sample. Analyze for HFPO-DA and PFOA.
T-1109 QC OTM-45 PPA CB FH of Filter Holder & Probe MeOH Rinse BT (Combine with *T-1108*)	QC	3/9/21	Blank Train	250 mL HDPE Wide-Mouth Bottle	**Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Blank Train HFPO-DA & PFOA Analysis	**Knoxville**: Use this solvent sample in the Filter extraction.

140-22287 Chain of Custody

Request for Analysis/Chain-of-Custody – RFA/COC #007
The Chemours Company – Fayetteville NC
PPA Carbon Bed Field QC Samples

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Require-ments	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
T-1110 QC OTM-45 PPA CB XAD-2 Resin Tube BT	QC	3/9/21	Blank Train	XAD-2 Resin Tube	**XAD-2 Resin Tube** OTM-45 Blank Train HFPO-DA & PFOA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Back-Half Glassware Rinse and the Impinger Glassware Methanol Rinse to assist the solvent extraction of the XAD-2 resin sample. Analyze for HFPO-DA and PFOA.
T-1111 QC OTM-45 PPA CB BH of Filter Holder & Coil Condenser MeOH Rinse BT (Combine with *T-1110*)	QC	3/9/21	Blank Train	250 mL HDPE Wide-Mouth Bottle	**Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Blank Train HFPO-DA & PFOA Analysis	**Knoxville**: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction. Analyze for HFPO-DA and PFOA.
T-1112 QC OTM-45 PPA CB Impingers 1,2 & 3 Condensate BT	QC	3/9/21	Blank Train	1 Liter HDPE Wide-Mouth Bottle	**Impinger #1, #2 & #3 Condensate** OTM-45 Blank Train HFPO-DA & PFOA Analysis	**Knoxville**: Analyze for HFPO-DA and PFOA.
T-1113 QC OTM-45 PPA CB Impinger Glassware MeOH Rinse BT (Combine with *T-1110*)	QC	3/9/21	Blank Train	250 mL HDPE Wide-Mouth Bottle	**Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse** OTM-45 Blank Train HFPO-DA & PFOA Analysis	**Knoxville**: Use this solvent sample in the XAD-2 Resin Extraction.
T-1114 QC OTM-45 PPA CB Breakthrough XAD-2 Resin Tube BT	QC	3/9/21	Blank Train	XAD-2 Resin Tube	**Breakthrough XAD-2 Resin Tube** OTM-45 Blank Train HFPO-DA & PFOA Analysis	**Knoxville**: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level and perform the regular XAD-2 Resin Extraction. Analyze for HFPO-DA and PFOA.

Request for Analysis/Chain-of-Custody – RFA/COC #007
The Chemours Company – Fayetteville NC
PPA Carbon Bed Field QC Samples

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Require-ments	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
T-1115 QC OTM-45 PPA CB DI Water RB	QC	3/9/24	Reagent Blank	250 mL HDPE Wide-Mouth Bottle	**Deionized (DI) Water Reagent Blank** OTM-45 Train HFPO-DA & PFOA Analysis	**Knoxville**: Analyze for HFPO-DA and PFOA.
T-1116 QC OTM-45 PPA CB MeOH with 5% NH_4OH RB	QC	3/9/24	Reagent Blank	250 mL HDPE Wide-Mouth Bottle	**Methanol with 5% NH_4OH Reagent Blank** OTM-45 Train HFPO-DA & PFOA Analysis	**Knoxville**: Analyze for HFPO-DA and PFOA.
T-1117 QC OTM-45 PPA CB Combined Glassware Rinses (MeOH/5% NH_4OH) PB	QC	3/9/24	Proof Blank	250 mL HDPE Wide-Mouth Bottle	**Front Half, Back Half and Impinger Glassware Rinses Proof Blank Composite** OTM-45 Train HFPO-DA & PFOA Analysis	**Knoxville**: Analyze for HFPO-DA and PFOA.

Sample Receipt Log and Condition of the Samples Upon Receipt:

Please fill in the following information:	Comments (Please write "NONE" if no comment applicable)
(1) Record the identities of any samples that were listed on the RFA but were not found in the sample shipment.	NONE
(2) Record the sample shipping cooler temperature of all coolers transporting samples listed on this RFA:	RT 1.9 / CT 1.6°C
(3) Record any apparent sample loss/breakage.	NONE
(4) Record any unidentified samples transported with this shipment of samples:	NONE
(5) Indicate if all samples were received according to the project's required specifications (i.e. no nonconformances):	HAND DELIVERED, NO CUSTODY SEALS

Custody Transfer:

	Name	Company	Date/Time
Relinquished By:	Patrick Young	Pembroke	3/12/21 / 1800
Accepted By:	Doug Caldwell	ETA KNOX	3/12/21 1800
Relinquished By:	Doug Caldwell	ETA KNOX	3/13/21 1048
Accepted By:	Ken Lee	ETA	3/13/21 1640
Relinquished By:			
Accepted By:			
Relinquished By:			
Accepted By:			

EUROFINS/TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST **Log In Number:**

Review Items	Yes	No	NA	If No, what was the problem?
1. Are the shipping containers intact?	✓			☐ **Containers, Broken**
2. Were ambient air containers received intact?			✓	☐ Checked in lab
3. The coolers/containers custody seal if present, is it intact?			✓	☐ Yes ☐ NA
4. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) Thermometer ID : SC7D Correction factor: -0.3C	✓			☐ **Cooler Out of Temp, Client Contacted, Proceed/Cancel** ☐ **Cooler Out of Temp, Same Day Receipt**
5. Were all of the sample containers received intact?	✓			☐ **Containers, Broken**
6. Were samples received in appropriate containers?	✓			☐ **Containers, Improper; Client Contacted; Proceed/Cancel**
7. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ **COC & Samples Do Not Match** ☐ **COC Incorrect/Incomplete** ☐ **COC Not Received**
8. Were all of the samples listed on the COC received?	✓			☐ **Sample Received, Not on COC** ☐ **Sample on COC, Not Received**
9. Is the date/time of sample collection noted?	✓			☐ **COC; No Date/Time; Client Contacted**
10. Was the sampler identified on the COC?			✓	☐ **Sampler Not Listed on COC**
11. Is the client and project name/# identified?	✓			☐ **COC Incorrect/Incomplete**
12. Are tests/parameters listed for each sample?	✓			☐ **COC No tests on COC**
13. Is the matrix of the samples noted?	✓			☐ **COC Incorrect/Incomplete**
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ **COC Incorrect/Incomplete**
15. Were samples received within holding time?	✓			☐ **Holding Time - Receipt**
16. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ **pH Adjusted, pH Included (See box 16A)** ☐ **Incorrect Preservative**
17. Were VOA samples received without headspace?			✓	☐ **Headspace (VOA only)**
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number:_____			✓	☐ **Residual Chlorine**
19. For 1613B water samples is pH<9?			✓	☐ If no, notify lab to adjust
20. For rad samples was sample activity info. Provided?				☐ Project missing info

Comments/Actions Taken

Labeling Verified by: **Date:**

pH test strip lot number:

	Box 16A: pH Preservation	Box 18A: Residual Chlorine
Preservative:		
Lot Number:		
Exp Date:		
Analyst:		
Date:		
Time:		

Project #: _____ PM Instructions: _____

Sample Receiving Associate: Ryan Jamison Date: 3-13-21

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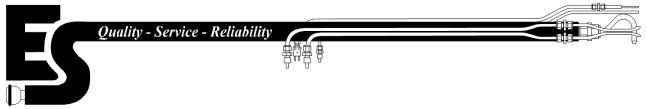
APPENDIX E
EQUIPMENT CALIBRATION DATA

Pretest Equipment Calibration Data

METHOD 5 DRY GAS METER CALIBRATION USING CRITICAL ORIFICES



1) Select three critical orifices to calibrate the dry gas meter which bracket the expected operating range.
2) Record barometric pressure before and after calibration procedure.
3) Run at tested vacuum (from Orifice Calibration Report), for a period of time necessary to achieve a minimum total volume of 5 cubic feet.
4) Record data and information in the **GREEN** cells, YELLOW cells are calculated.

					INITIAL	FINAL	AVG (P_{bar})
DATE:	2/10/2021	METER SERIAL #:	MB3	BAROMETRIC PRESSURE (in Hg):	30.38	30.38	30.38
METER PART #:		CRITICAL ORIFICE SET SERIAL #:	1393				

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT^3) INITIAL	DGM READINGS (FT^3) FINAL	DGM READINGS (FT^3) NET (V_m)	TEMPERATURES °F AMBIENT	DGM INLET INITIAL	DGM INLET FINAL	DGM OUTLET INITIAL	DGM OUTLET FINAL	DGM AVG	ELAPSED TIME (MIN) q	DGM DH (in H_2O)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	Y % Diff to Average Y	Y % Diff with other orifices	$DH_@$
11	1	0.306	24	889.290	895.162	5.872	57	60	61	60	60	60.25	15.00	0.44	6.0587	6.1346	1.013			1.53
	2	0.306																		
	3	0.306																		
																AVG =	1.013	1.06	1.35	
16	1	0.4268	22.5	895.162	900.693	5.531	58	61	62	60	61	61	10.00	0.86	5.7045	5.6987	0.999			1.54
	2	0.4268																		
	3	0.4268																		
																AVG =	0.999	-0.29	-0.20	
18	1	0.4961	21.5	900.693	907.113	6.420	58	62	63	61	61	61.75	10.00	1.2	6.6172	6.6240	1.001			1.59
	2	0.4961																		
	3	0.4961																		
																AVG =	1.001	-0.09	0.47	
26	1	0.7131	19	907.113	916.371	9.258	58	63	65	61	62	62.75	10.00	2.6	9.5563	9.5215	0.996			1.67
	2	0.7131																		
	3	0.7131																		
																AVG =	0.996	-0.56	-0.43	
31	1	0.8358	17.5	916.371	927.180	10.809	58	65	67	62	63	64.25	10.00	3.6	11.1521	11.1598	1.001			1.68
	2	0.8358																		
	3	0.8358																		
																AVG =	1.001	-0.12	0.44	

USING THE CRITICAL ORIFICES AS CALIBRATION STANDARDS:
The following equations are used to calculate the standard volumes of air passed through the DGM, V_m (std), and the critical orifice, V_{cr} (std), and the DGM calibration factor, Y. These equations are automatically calculated in the spreadsheet above.

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = 1.002

AVERAGE $DH_@$ = 1.60

(1) $$Vm_{(std)} = K_1 * Vm * \frac{Pbar + (\Delta H / 13.6)}{Tm}$$

= Net volume of gas sample passed through DGM, corrected to standard conditions
K_1 = 17.64 °R/in. Hg (English), 0.3858 °K/mm Hg (Metric)
T_m = Absolute DGM avg. temperature (°R - English, °K - Metric)

(2) $$Vcr_{(std)} = K' * \frac{Pbar * \Theta}{\sqrt{Tamb}}$$

= Volume of gas sample passed through the critical orifice, corrected to standard conditions
T_{amb} = Absolute ambient temperature (°R - English, °K - Metric)
K' = Average K' factor from Critical Orifice Calibration

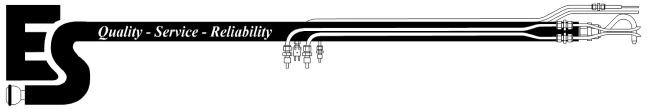
(3) $$Y = \frac{Vcr_{(std)}}{Vm_{(std)}}$$

= DGM calibration factor

$$DH_@ = \left(\frac{0.75\ q}{V_{cr(std)}}\right)^2 DH \left(\frac{V_{m(std)}}{V_m}\right)$$

RAMBOLL

METHOD 5 DRY GAS METER CALIBRATION USING CRITICAL ORIFICES



1) Select three critical orifices to calibrate the dry gas meter which bracket the expected operating range.
2) Record barometric pressure before and after calibration procedure.
3) Run at tested vacuum (from Orifice Calibration Report), for a period of time necessary to achieve a minimum total volume of 5 cubic feet.
4) Record data and information in the **GREEN** cells, YELLOW cells are calculated.

					INITIAL	FINAL	AVG (P_{bar})
DATE:	1/11/2021	METER SERIAL #:	MB 5	BAROMETRIC PRESSURE (in Hg):	29.92	29.92	29.92
METER PART #:		CRITICAL ORIFICE SET SERIAL #:	1393				

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT^3) INITIAL	DGM READINGS (FT^3) FINAL	DGM READINGS (FT^3) NET (V_m)	TEMPERATURES °F AMBIENT	DGM INLET INITIAL	DGM INLET FINAL	DGM OUTLET INITIAL	DGM OUTLET FINAL	DGM AVG	ELAPSED TIME (MIN) q	DGM DH (in H_2O)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	Y % Diff to Average Y	Y % Diff with other orifices	$DH_@$
11	1	0.306	23.5	606.287	614.284	7.997	64	65	66	67	66	66	20.00	0.51	8.0390	8.0016	0.995			1.80
	2	0.306																		
	3	0.306																		
																AVG =	0.995	0.43	0.82	
16	1	0.4268	22	614.297	619.908	5.611	65	66	67	66	66	66.25	10.00	1.05	5.6453	5.5749	0.988			1.91
	2	0.4268																		
	3	0.4268																		
																AVG =	0.988	-0.36	0.02	
18	1	0.4961	21	619.923	626.441	6.518	66	67	68	66	66	66.75	10.00	1.4	6.5572	6.4739	0.987			1.89
	2	0.4961																		
	3	0.4961																		
																AVG =	0.987	-0.38	-0.02	
26	1	0.7131	19	626.447	635.794	9.347	66	68	72	67	67	68.5	10.00	2.9	9.4065	9.3057	0.989			1.90
	2	0.7131																		
	3	0.7131																		
																AVG =	0.989	-0.18	0.20	
31	1	0.8358	17.5	635.813	646.695	10.882	67	71	74	68	69	70.5	10.00	4	10.9392	10.8965	0.996			1.90
	2	0.8358																		
	3	0.8358																		
																AVG =	0.996	0.50	0.89	

USING THE CRITICAL ORIFICES AS CALIBRATION STANDARDS:
The following equations are used to calculate the standard volumes of air passed through the DGM, V_m (std), and the critical orifice, V_{cr} (std), and the DGM calibration factor, Y. These equations are automatically calculated in the spreadsheet above.

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = 0.991

AVERAGE $DH_@$ = 1.88

(1) $$Vm_{(std)} = K_1 * Vm * \frac{Pbar + (\Delta H / 13.6)}{Tm}$$

= Net volume of gas sample passed through DGM, corrected to standard conditions
K_1 = 17.64 °R/in. Hg (English), 0.3858 °K/mm Hg (Metric)
T_m = Absolute DGM avg. temperature (°R - English, °K - Metric)

(2) $$Vcr_{(std)} = K' * \frac{Pbar * \Theta}{\sqrt{Tamb}}$$

= Volume of gas sample passed through the critical orifice, corrected to standard conditions
T_{amb} = Absolute ambient temperature (°R - English, °K - Metric)
K' = Average K' factor from Critical Orifice Calibration

(3) $$Y = \frac{Vcr_{(std)}}{Vm_{(std)}}$$

= DGM calibration factor

$$DH_@ = \left(\frac{0.75\ q}{V_{cr(std)}}\right)^2 DH \left(\frac{V_{m(std)}}{V_m}\right)$$

RAMBOLL

Initial Oven Box Thermocouple Calibration

ID Number	Ice Bath			Ambient			Hot Water Bath			Technician	Date Performed
	Reference Temperature (^{o}R)	Thermocouple Temperature (^{o}R)	Deviation*	Reference Temperature (^{o}R)	Thermocouple Temperature (^{o}R)	Deviation*	Reference Temperature (^{o}R)	Thermocouple Temperature (^{o}R)	Deviation*		
OB-1	491.67	492.67	0.2%	524.67	523.67	-0.2%	671.67	673.67	0.3%	SMilo	02/22/21
OB-2	491.67	492	0.1%	530.67	531	0.1%	671.67	672	0.0%	SRW	03/02/21
OB-3	491.67	493	0.3%	530.67	530	-0.1%	671.67	671	-0.1%	SRW	03/02/21
OB-4	491.67	493.67	0.4%	524.67	524.67	0.0%	671.67	670.67	-0.1%	SMilo	02/22/21
OB-A	491.67	493	0.3%	530.67	529	-0.3%	671.67	673	0.2%	SRW	03/02/21
OB-B	491.67	492	0.1%	530.67	530	-0.1%	671.67	672	0.0%	SRW	03/02/21
OB-5	491.67	492	0.1%	530.67	530	-0.1%	671.67	670	-0.2%	SRW	03/02/21
OB-C	491.67	492	0.1%	530.67	529	-0.3%	671.67	674	0.3%	SRW	03/03/21
OB-6	491.67	493.67	0.4%	524.67	525	0.1%	671.67	669.67	-0.3%	SMilo	02/22/21
OB-7	491.67	494.67	0.6%	524.67	525	0.1%	671.67	669.67	-0.3%	SMilo	02/22/21
OB-E	491.67	492	0.1%	530.67	529	-0.3%	671.67	671.67	0.0%	SRW	03/03/21
OB-10	491.67	492	0.1%	530.67	531	0.1%	671.67	670	-0.2%	SRW	03/03/21
OB-11	491.67	495	0.7%	530.67	532	0.3%	671.67	672	0.0%	SRW	03/03/21
OB-12	491.67	493	0.3%	530.67	531	0.1%	671.67	671	-0.1%	SRW	03/03/21

Reference Thermocouple: Fluke S/N: 83450033 or S/N 90460057 traceable to the Untied States National Institute of Standards and Technology

*Acceptable Deviation: 1.5%

Initial Impinger Outlet Thermocouple Calibration

ID Number	Ice Bath			Ambient			Hot Water Bath			Technician	Date Performed
	Reference Temperature (^{o}Rk)	Thermocouple Temperature (^{o}Rk)	Deviation*	Reference Temperature (^{o}Rk)	Thermocouple Temperature (^{o}Rk)	Deviation*	Reference Temperature (^{o}Rk)	Thermocouple Temperature (^{o}Rk)	Deviation*		
IO-1	494.17	493.87	-0.1%	524.37	523.17	-0.2%	672.17	672.67	0.1%	SM	03/16/21
IO-2	493.67	493.87	0.0%	524.57	523.17	-0.3%	671.77	672.67	0.1%	SM	03/16/21
IO-3	493.57	493.87	0.1%	521.37	523.17	0.3%	671.77	672.67	0.1%	SM	03/16/21
IO-4	493.97	493.87	0.0%	524.37	523.17	-0.2%	671.17	672.67	0.2%	SM	03/16/21
IO-5	493.77	493.87	0.0%	524.07	523.17	-0.2%	672.37	672.67	0.0%	SM	03/16/21
IO-6	493.97	493.87	0.0%	522.97	523.17	0.0%	670.77	672.67	0.3%	SM	03/16/21
IO-7	493.17	493.87	0.1%	524.37	523.17	-0.2%	671.37	672.67	0.2%	SM	03/16/21
IO-8	494.37	493.87	-0.1%	523.67	523.17	-0.1%	670.37	672.67	0.3%	SM	03/16/21
IO-9											
IO-10	493.77	493.87	0.0%	524.27	523.17	-0.2%	671.27	672.67	0.2%	SM	03/16/21
IO-11	494.37	493.87	-0.1%	524.37	523.17	-0.2%	672.27	672.67	0.1%	SM	03/16/21
IO-12	493.77	493.87	0.0%	522.17	523.17	0.2%	671.47	672.67	0.2%	SM	03/16/21
IO-13										SM	03/16/21
IO-14	493.87	493.87	0.0%	524.37	523.17	-0.2%	670.87	672.67	0.3%	SM	03/16/21
IO-15	494.17	493.87	-0.1%	524.37	523.17	-0.2%	671.47	672.67	0.2%	SM	03/16/21
IO-16	494.37	493.87	-0.1%	524.37	523.17	-0.2%	671.07	672.67	0.2%	SM	03/16/21
IO-17	493.37	493.87	0.1%	522.17			670.97				
IO-18	494.17	493.87	-0.1%	524.37	523.17	-0.2%	671.27	672.67	0.2%	SM	03/16/21
IO-19	493.97	493.87	0.0%	524.77	523.17	-0.3%	672.97	672.67	0.0%	SM	03/16/21

Reference Thermocouple: Fluke S/N: 83450033 or S/N 90460057 traceable to the Untied States National Institute of Standards and Technology
*Acceptable Deviation: 1.5%

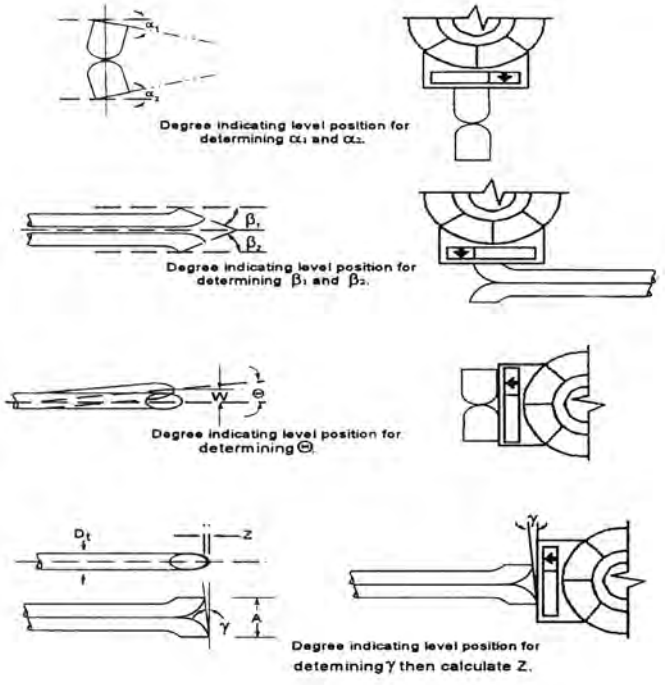
Initial Sample Probe Calibration Form

Probe ID: P4-1/TC-7C | Date: 01/28/21 | Technician: S. Waters

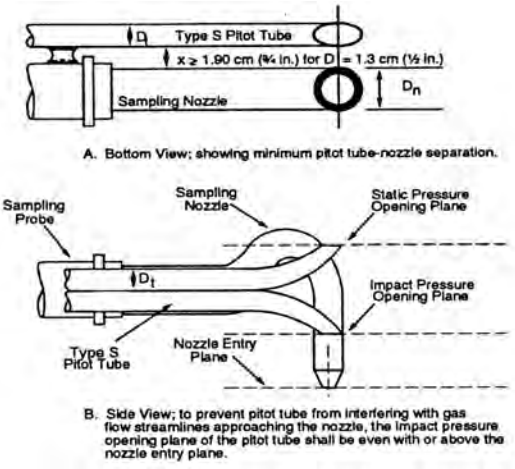
"S" Type Pitot Calibration

Is the Pitot Level and Perpindicular?	Yes
Is There any Obstruction?	No
Is the Pitot Damaged	No
α_1 ($-10^o = \alpha_1 = +10^o$)	1
α_2 ($-10^o = \alpha_2 = +10^o$)	0
$ß_1$ ($-5^o = ß_1 = +5^o$)	1
$ß_2$ ($-5^o = ß_2 = +5^o$)	1
γ	1
Θ	0
z = A Tan γ (< 0.125")	0.011
W = A Tan Θ (< 0.03125")	0.0000
D_t (3/16 = D_t = 3/8")	0.252
A	0.655
$A/2D_t$ (1.05 = P_A/D_t = 1.5)	1.300

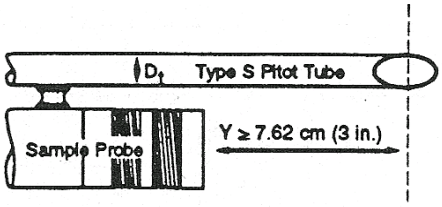
Source: Quality Assurance Handbook for Air Pollution Measurement Systems: Volume III, Stationary Source-Specific Methods. EPA/600/R-94/038c, September 30, 1994



Verification of "S" Type Pitot, Thermocouple and Nozzle Placement



Does X Exceed 0.75 inches?	Yes
Does Y Exceed 3 inches?	NA



Thermocouple Calibration

	Ice Bath °R			Ambient °R			Boiling Water °R		
	1	2	3	1	2	3	1	2	3
Reference Temp	492	492	492	526	526	526	672	672	672
Thermocouple Temp	492	492	492	525	525	525	672	672	672
Difference (%)	0.0	0.0	0.0	-0.2	-0.2	-0.2	0.0	0.0	0.0

Temperature values must be within 1.5% of reference temperature

I certify that the probe ID P4-1/TC-7C meets or exceeds all specifications, criteria and/or applicable design features and is herby assigned a pitot tube calibration factor C_p of 0.84.

Certified By: S. Waters Date: 01/28/21

RAMBOLL

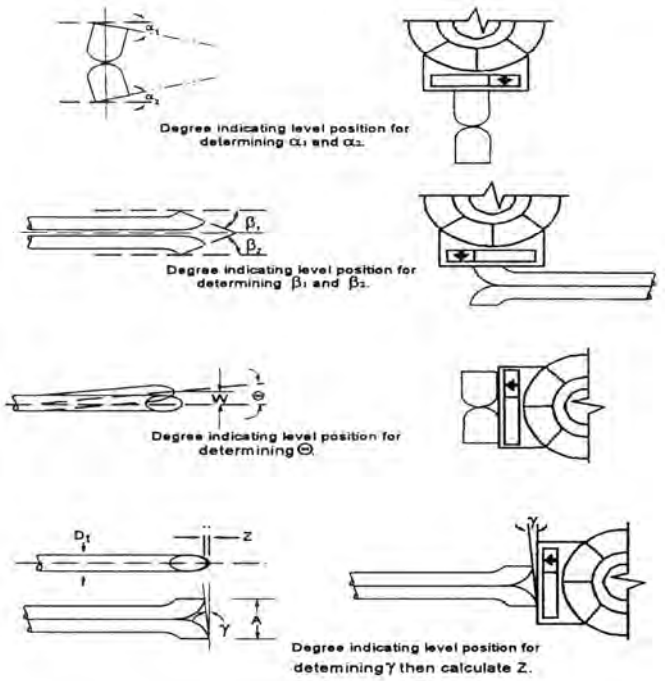
Initial Sample Probe Calibration Form

Probe ID: P4-2/TC-5D | Date: 06/16/20 | Technician: P. Grady

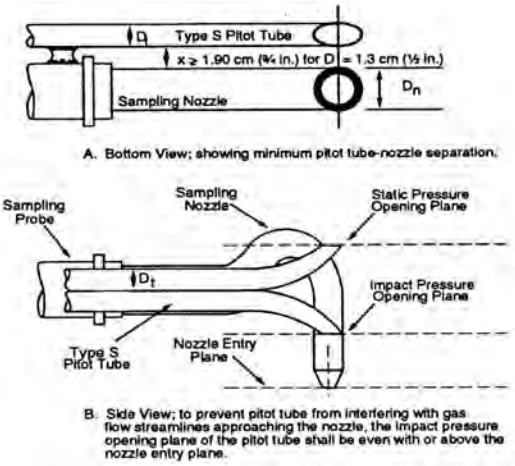
"S" Type Pitot Calibration

Is the Pitot Level and Perpindicular?	Yes
Is There any Obstruction?	No
Is the Pitot Damaged	No
α_1 ($-10^o = \alpha_1 = +10^o$)	2
α_2 ($-10^o = \alpha_2 = +10^o$)	1
β_1 ($-5^o = \beta_1 = +5^o$)	1
β_2 ($-5^o = \beta_2 = +5^o$)	1
γ	1
Θ	0
z = A Tan γ (< 0.125")	0.011
W = A Tan Θ (< 0.03125")	0.0000
D_t (3/16 = D_t = 3/8")	0.251
A	0.650
$A/2D_t$ (1.05 = P_A/D_t = 1.5)	1.295

Source: Quality Assurance Handbook for Air Pollution Measurement Systems: Volume III, Stationary Source-Specific Methods. EPA/600/R-94/038c, September 30, 1994

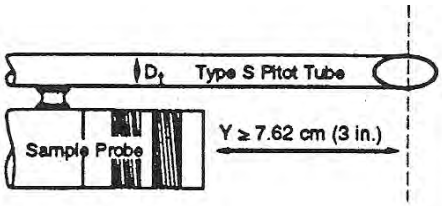


Verification of "S" Type Pitot, Thermocouple and Nozzle Placement



Does X Exceed 0.75 inches? Yes

Does Y Exceed 3 inches? NA



Thermocouple Calibration

	Ice Bath ^oR			Ambient ^oR			Boiling Water ^oR		
	1	2	3	1	2	3	1	2	3
Reference Temp	492.3	492.3	492.3	533.4	533.4	533.4	671.5	671.5	671.5
Thermocouple Temp	492.9	492.8	492.8	532.7	532.6	532.7	673.1	673	673
Difference (%)	0.1	0.1	0.1	-0.1	-0.1	-0.1	0.2	0.2	0.2

Temperature values must be within 1.5% of reference temperature

I certify that the probe ID P4-2/TC-5D meets or exceeds all specifications, criteria and/or applicable design features and is herby assigned a pitot tube calibration factor C_p of 0.84.

Certified By: P. Grady Date: 06/16/20

Post Test Equipment Calibration Data

POST TEST DRY GAS METER CALIBRATION

DATE:	03/17/21	METER BOX #:	3	BAROMETRIC PRESSURE (in Hg):	INITIAL 29.99	FINAL 29.99	AVG (P_{bar}) 29.99
TECHNICIAN:	S.Milo	CRITICAL ORIFICE SET SERIAL #:	1393				

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT^3) INITIAL	DGM READINGS (FT^3) FINAL	NET (V_m)	TEMPERATURES °F AMBIENT	DGM INLET INITIAL	DGM INLET FINAL	DGM OUTLET INITIAL	DGM OUTLET FINAL	DGM AVG	ELAPSED TIME (MIN) q	DGM DH ($in H_2O$)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	Y % Diff to Average Y	$DH_@$
	1																		
	2																		
	3																		
																AVG =			
18	1	0.4961	21	273.710	280.129	6.419	68	67	68	66	66	66.75	10.00	1.2	6.4695	6.4767	1.001	0.18	1.62
	2	0.4961	21	280.129	287.222	7.093	68	68	69	67	67	67.75	11.00	1.2	7.1352	7.1244	0.998	-0.09	1.62
	3	0.4961	21	287.222	293.667	6.445	70	69	70	67	68	68.5	10.00	1.2	6.4742	6.4645	0.999	-0.09	1.62
																AVG =	0.999		
	1																		
	2																		
	3																		
																AVG =			

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = 0.999

PRE-DETERMINED DRY GAS METER CALIBRATION FACTOR, Y = 1.002

PERCENT DIFFERENCE = -0.3

POST TEST DRY GAS METER CALIBRATION

DATE:	03/17/21	METER BOX #:	5	BAROMETRIC PRESSURE (in Hg):	INITIAL 29.99	FINAL 29.99	AVG (P_{bar}) 29.99
TECHNICIAN:	S. Milo	CRITICAL ORIFICE SET SERIAL #:	1393				

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT^3) INITIAL	DGM READINGS (FT^3) FINAL	NET (V_m)	TEMPERATURES °F AMBIENT	DGM INLET INITIAL	DGM INLET FINAL	DGM OUTLET INITIAL	DGM OUTLET FINAL	DGM AVG	ELAPSED TIME (MIN) q	DGM DH ($in H_2O$)	(1) V_m (STD)	(2) V_{cr} (STD)	(3) Y	Y % Diff to Average Y	$DH_@$
	1																		
	2																		
	3																		
																AVG =			
18	1	0.4961	21	333.449	339.942	6.493	71	66	67	63	64	65	10.00	1.4	6.5691	6.4584	0.983	0.06	1.91
	2	0.4961	21	339.942	346.462	6.520	71	67	70	64	65	66.5	10.00	1.4	6.5776	6.4584	0.982	-0.07	1.90
	3	0.4961	21	346.462	352.996	6.534	72	70	71	66	67	68.5	10.00	1.4	6.5668	6.4523	0.983	0.00	1.90
																AVG =	0.983		
	1																		
	2																		
	3																		
																AVG =			

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = 0.983

PRE-DETERMINED DRY GAS METER CALIBRATION FACTOR, Y = 0.991

PERCENT DIFFERENCE = -0.9