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SOURCE EMISSIONS TESTING OF THE VINYL ETHERS NORTH CARBON BED

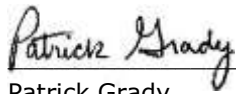
SOURCE EMISSIONS TESTING OF THE VINYL ETHERS NORTH CARBON BED

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Prepared by **Patrick Grady, Project Associate**
Checked by **David Ostaszewski, PE, Senior Managing Engineer**

Ramboll
7600 Morgan Road
Liverpool, NY 13090
USA

T 315-637-2234
F 315-637-2819
<https://ramboll.com>

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.



Patrick Grady
Project Associate
Ramboll

Ramboll
7600 Morgan Road
Liverpool, NY 13090
USA

T 315-637-2234
F 315-637-2819
<https://ramboll.com>



David Ostaszewski, PE
Senior Managing Engineer
Ramboll

CONTENTS

1.	Introduction and Background	3
1.1	Testing Objective	3
1.2	Emissions Testing Program Participants	3
2.	Process Description	5
2.1	Process Description	5
2.2	Operating Conditions During Testing	5
3.	Summary of Test Program	6
3.1	Test Program Summary	6
4.	Sampling and Analytical Procedures	7
4.1	Test Methods	7
4.2	Sampling Locations	7
4.3	Gas Velocity and Volumetric Flow Rate	7
4.4	Oxygen and Carbon Dioxide Concentrations	8
4.5	Moisture Content	8
4.6	HFPO-DA Emissions	8
4.6.1	HFPO-DA Sample Train and Equipment Preparation	8
4.6.2	HFPO-DA Sample Train Recovery	9
5.	Emissions Test Results	10
5.1	Emission Test Results	10
5.2	Discussion and Conclusion	10
6.	Quality Assurance/Quality Control	11
6.1	Equipment Calibration	11
6.2	Equipment Leak Checks	11
6.3	Reagent Blanks and Field Blanks	12
6.4	Test Data and Report Review	12

LIST OF TABLES

1. Summary of Emission Test Results

LIST OF APPENDICES

- A. Process Operating Data
- B. Schematic of the Test Locations
- C. Field Data and Calculations
- D. Laboratory Data
- E. Equipment Calibration Data

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 December 9, 2020. Messrs. Patrick Grady, Jeff Sheldon, Antonio Anderson, Brian Goodhile, Samantha Waters and Eric Alongi 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 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.

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 (O₂) and carbon dioxide (CO₂) 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 O₂ and CO₂ 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. H₂O.

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% NH₄OH) 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% NH₄OH 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% NH₄OH 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% NH₄OH 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% NH₄OH 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 2.79E-01 mg/dscm to 5.59E-01 mg/dscm and averaged 4.09E-01 mg/dscm. Corresponding mass emissions of HFPO-DA ranged from 1.92E-02 lb/hr to 3.80E-02 lb/hr and averaged 2.79E-02 lb/hr.

Concentrations of HFPO-DA at the carbon bed outlet ranged from 6.14E-04 mg/dscm to 3.35E-03 mg/dscm and averaged 1.58E-03 mg/dscm. Mass emission rates of HFPO-DA from the carbon bed outlet ranged from 5.17E-05 lb/hr to 2.82E-04 lb/hr and averaged 1.32E-04 lb/hr. The resulting HFPO-DA removal efficiency of the VEN carbon bed was 99.5 percent for all three 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 $\pm 2^{\circ}\text{F}$; DGM $\pm 5.4^{\circ}\text{F}$; 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 ft³. 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 the carbon bed outlet test location 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% NH₄OH solution to evaluate the general rinsing efficiency of the sampling train recovery process.

Reagent blanks of the diH₂O used in the sample trains and MeOH/5% NH₄OH solution used for sample recovery were also submitted to the laboratory for analysis along with the field samples. 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.

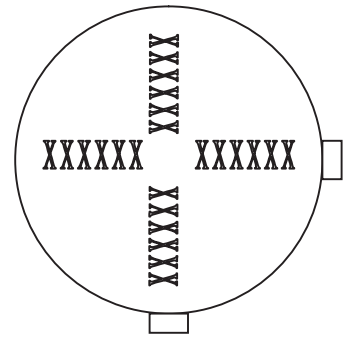
TABLES

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:	<u>Carbon Bed Inlet</u>				<u>Carbon Bed Outlet</u>			
Run Date	09Dec20	09Dec20	09Dec20		09Dec20	09Dec20	09Dec20	
Start/Stop Time	1050-1247	1430-1623	1657-1850		1050-1245	1430-1623	1657-1850	
<u>Exhaust Gas Conditions</u>								
Temperature (deg. F)	58	63	61	61	62	67	69	66
Moisture (volume %)	0.8	0.6	0.8	0.7	0.9	0.8	0.6	0.7
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
<u>Volumetric Flow Rate</u>								
acfm	18,058	18,080	17,982	18,040	21,393	22,339	22,318	22,017
dscfm	18,314	18,176	18,126	18,205	21,708	22,487	22,429	22,208
<u>HFPO - Dimer Acid</u>								
mg/dscm	2.79E-01	5.59E-01	3.90E-01	4.09E-01	7.69E-04	6.14E-04	3.35E-03	1.58E-03
lb/hr	1.92E-02	3.80E-02	2.65E-02	2.79E-02	6.25E-05	5.17E-05	2.82E-04	1.32E-04
<u>Carbon Bed Removal Efficiency</u>								
percent	99.7	99.9	98.9	99.5				

APPENDIX A PROCESS OPERATING DATA

APPENDIX B SCHEMATICS OF THE TEST LOCATIONS



Crosssectional Area Showing
Velocity Traverse Point Locations

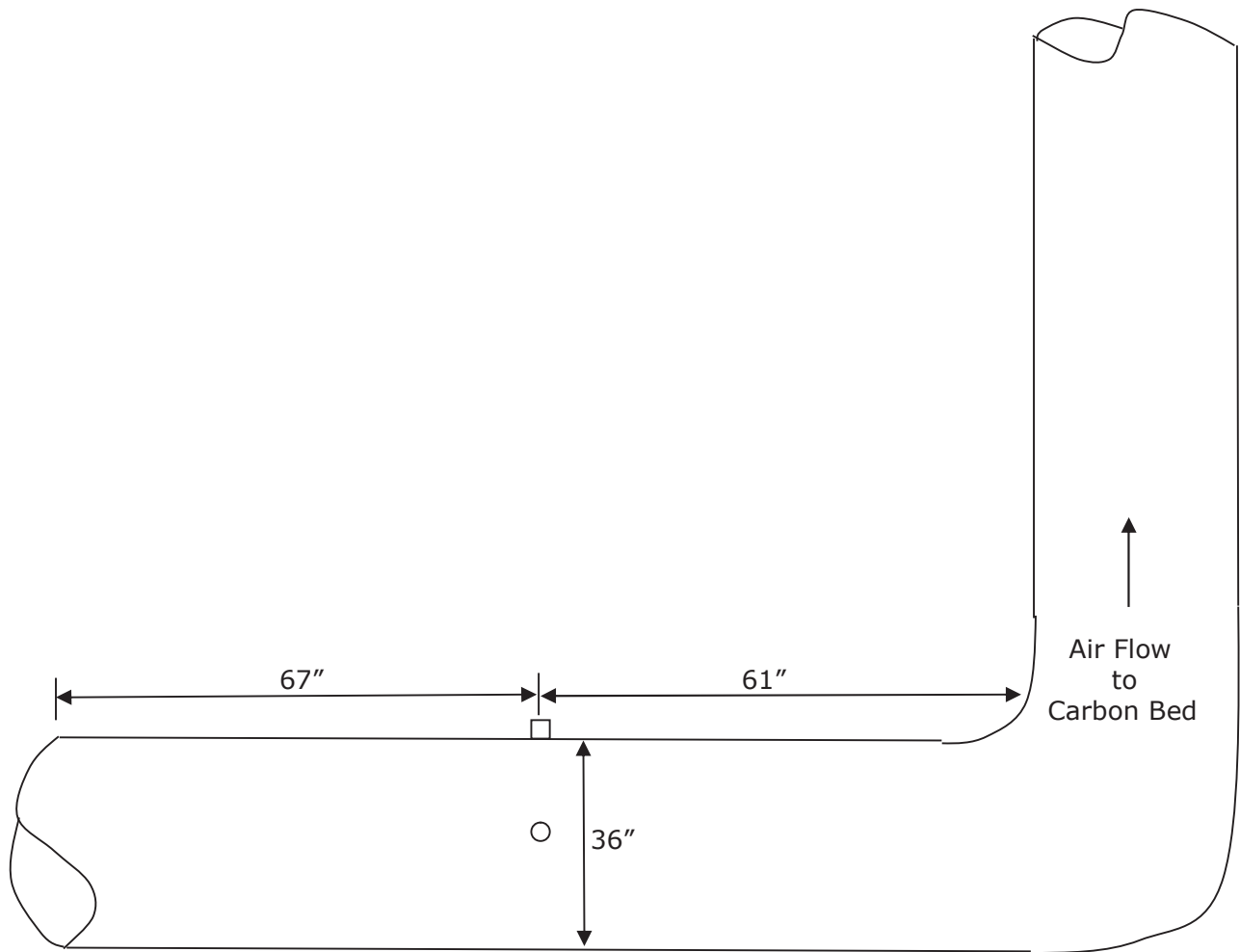


Figure 1
Carbon Bed Inlet Sampling Location
Vinyl Ethers North
The Chemours Company
Fayetteville, North Carolina

Sample Traverse Point Locations for Circular Stacks

Facility: The Chemours Company

Source Identification: VEN Carbon Bed Inlet

Stack Diameter: 36 inches

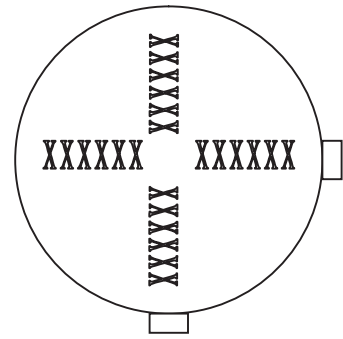
Sampling Locations: 1.9 diameters downstream
1.7 diameters upstream

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.



Crosssectional Area Showing
Velocity Traverse Point Locations

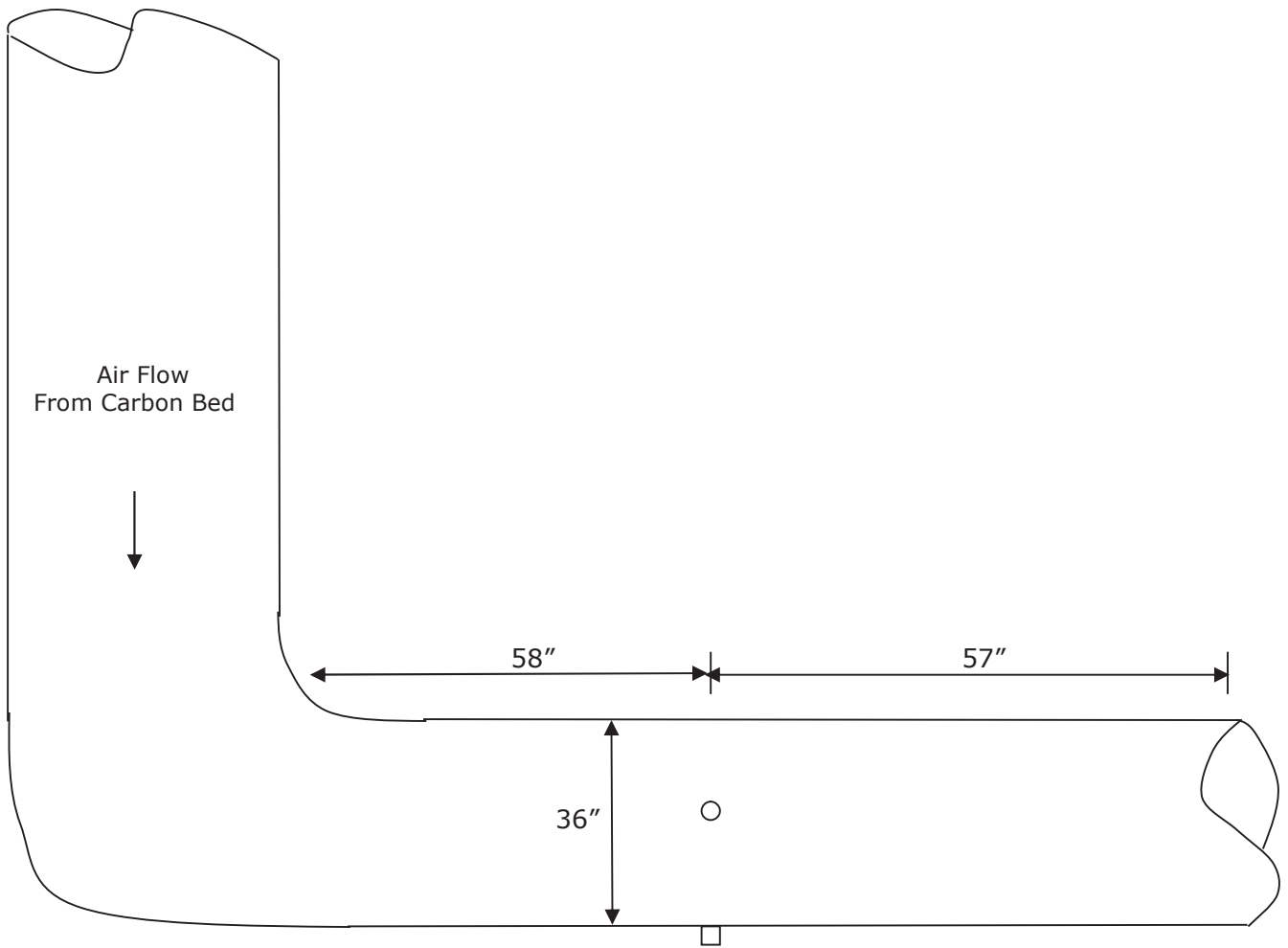


Figure 2
Carbon Bed Outlet Sampling Location
Vinyl Ethers North
The Chemours Company
Fayetteville, North Carolina

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

Traverse Point	Run 1						Run 2						Run 3					
	Stack Temp(F)	Delta P	Delta H	Tm(F)		SQRT Delta P	Stack Temp(F)	Delta P	Delta H	Tm(F)		SQRT Delta P	Stack Temp(F)	Delta P	Delta H	Tm(F)		SQRT Delta P
				in	out					in	out					in	out	
A1	56	0.72	2.38	48	44	0.8485	63	0.73	2.41	58	57	0.8544	63	0.66	2.18	58	57	0.8124
2	57	0.72	2.38	52	44	0.8485	65	0.73	2.41	59	57	0.8544	63	0.65	2.15	60	57	0.8062
3	57	0.62	2.04	57	46	0.7874	63	0.71	2.34	62	57	0.8426	63	0.62	2.04	62	57	0.7874
4	56	0.62	2.04	58	46	0.7874	63	0.66	2.18	63	57	0.8124	63	0.62	2.04	64	58	0.7874
5	56	0.62	2.04	60	48	0.7874	60	0.62	2.04	64	57	0.7874	62	0.60	1.98	64	57	0.7746
6	56	0.64	2.11	62	49	0.8000	63	0.59	1.95	64	57	0.7681	61	0.60	1.98	64	58	0.7746
7	56	0.64	2.11	62	49	0.8000	63	0.59	1.95	64	62	0.7681	62	0.55	1.82	64	57	0.7416
8	57	0.50	1.65	62	50	0.7071	63	0.49	1.67	64	58	0.7000	62	0.49	1.67	64	57	0.7000
9	57	0.50	1.65	63	51	0.7071	63	0.49	1.67	64	58	0.7000	62	0.47	1.55	64	57	0.6856
10	57	0.49	1.67	63	52	0.7000	63	0.42	1.39	64	58	0.6481	62	0.45	1.49	64	57	0.6708
11	57	0.49	1.67	63	52	0.7000	63	0.44	1.45	64	58	0.6633	61	0.45	1.49	64	57	0.6708
12	57	0.49	1.67	63	53	0.7000	63	0.44	1.45	64	59	0.6633	60	0.46	1.52	64	57	0.6782
B1	58	0.50	1.65	60	55	0.7071	63	0.59	1.95	58	57	0.7681	61	0.65	2.15	58	55	0.8062
2	58	0.64	2.11	61	55	0.8000	64	0.59	1.95	61	58	0.7681	60	0.61	2.01	59	55	0.7810
3	58	0.64	2.11	63	55	0.8000	64	0.59	1.95	63	57	0.7681	60	0.60	1.98	61	55	0.7746
4	58	0.60	1.98	64	56	0.7746	64	0.59	1.95	65	60	0.7681	61	0.60	1.98	62	55	0.7746
5	59	0.59	1.95	65	57	0.7681	64	0.59	1.95	65	58	0.7681	61	0.61	2.01	63	55	0.7810
6	59	0.59	1.95	65	57	0.7681	64	0.56	1.85	66	58	0.7483	60	0.60	1.98	63	56	0.7746
7	59	0.62	2.04	65	57	0.7874	63	0.56	1.85	65	58	0.7483	60	0.60	1.98	61	55	0.7746
8	59	0.62	2.04	68	57	0.7874	64	0.56	1.85	66	60	0.7483	60	0.60	1.98	62	55	0.7746
9	59	0.59	1.95	65	58	0.7681	63	0.56	1.85	65	59	0.7483	60	0.60	1.98	62	56	0.7746
10	60	0.60	1.98	65	58	0.7746	64	0.64	2.11	66	59	0.8000	60	0.60	1.98	62	56	0.7746
11	60	0.53	1.75	64	58	0.7280	64	0.64	2.11	66	59	0.8000	61	0.60	1.98	62	56	0.7746
12	60	0.53	1.75	65	58	0.7280	64	0.64	2.11	66	59	0.8000	60	0.60	1.98	62	55	0.7746
						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
Average	58	0.59	1.94	62	53	0.7652	63	0.58	1.93	64	58	0.7623	61	0.58	1.91	62	56	0.7596

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

<u>Parameter</u>	<u>Run 1</u>	<u>Run 2</u>	<u>Run 3</u>
Run Date	12/9/20	12/9/20	12/9/20
Start/Stop Time	1050-1247	1430-1623	1657-1850
Duration of Run, Minutes	96	96	96
Ave. Nozzle Diameter, inches	0.245	0.245	0.245
Pitot Calibration Factor, CF	0.84	0.84	0.84
Meter Gamma	1.004	1.004	1.004
Meter Delta H, inches of H2O	1.64	1.64	1.64
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	30.04	30.04	30.04
Static Pressure, inches of H2O	-0.6	-0.6	-0.6
<u>Dry Gas Meter Sample Volume, (VM)ft³</u>			
Initial	283.556	358.369	432.915
Final	358.245	432.706	506.798
Total Volume	74.439	74.258	73.672
Ave. Stack Temperature, Ts(F)	57.8	63.3	61.2
Ave. Meter Temperature, Tm(F)	57.3	60.9	59.2
Ave. Run Delta H, inches of H2O	1.94	1.93	1.91
Ave. Square Root of Delta P	0.7652	0.7623	0.7596
<u>Moisture Data</u>			
Volume of water collected, mls	-0.8	-1.4	-0.6
Silica Gel, grams	14	11.4	12.8
Total Collected, mls	13.2	10	12.2
<u>ORSAT Data</u>			
%O2	20.90	20.90	20.90
%CO2	0.0	0.0	0.0
%CO			

Calculations

Vw(std), scf =	0.621	0.471	0.574
Vm(std), dscf =	76.960	76.233	75.871
Bws =	0.008	0.006	0.008
Md =	28.84	28.84	28.84
Ms =	28.75	28.77	28.75
Vs, ft/sec =	42.6	42.6	42.4
Qs, acfm =	18,058	18,080	17,982
Qs(std), dscfm =	18,314	18,176	18,126
Isokinetic Sampling Rate, %	94.5	94.3	94.1

Where:

An = area of the nozzle

As = area of the stack

Vw(std) = volume of water vapor in gas, standard conditions = $0.04707 \cdot Vlc$

Vm(std) = vol. of gas sampled, standard conditions = $17.647 \cdot Vm \cdot \gamma \cdot [Pb + (dH/13.6)] / Tm(R)$

Bws = water vapor in gas stream, proportion by volume = $Vw(std) / (Vm(std) + Vw(std))$

Md = molecular weight of stack gas, dry basis = $(0.44 \cdot \%CO_2) + (0.32 \cdot \%O_2) + [0.28 \cdot (\%N_2 + \%CO)]$

Ms = molecular weight of stack gas, wet basis = $[Md \cdot (1 - Bws)] + (18.0 \cdot Bws)$

Vs = stack gas velocity = $85.49 \cdot Cp \cdot (\text{avg. Sq.Rt. dP}) \cdot [Sq.Rt. (Ts(R)) / (Ms \cdot Ps)]$

Qs = stack gas flow rate = $Vs \cdot As \cdot 60$

Qs(std) = stack gas flow rate, standard conditions = $Qs \cdot (1 - Bws) \cdot (528 / (Ts(R))) \cdot (Ps / 29.92)$

Isokinetic sampling rate = $\{ (Ts(R)) \cdot [(0.00267 \cdot Vlc) + (Vm(std) / 17.647)] \cdot 100 \} / (\text{Time} \cdot vs \cdot Ps \cdot An \cdot x60)$

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	0.60903	2.79E-01	2.04E-02	1.92E-02	1.20615	5.59E-01	4.07E-02	3.80E-02	0.83703	3.90E-01	2.84E-02	2.65E-02	0.88	4.09E-01	2.98E-02	2.79E-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: 283.556
Final gas meter volume: 358.245
Difference: 74.689

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

$$\begin{aligned} &= 17.647 \times Vm, a \times \text{Gamma} \times [\text{Pbar} + (\text{DeltaH}/13.6)] / Tm(R) \\ &= 17.647 \times 74.689 \times 1.004 \times (30.04 + [(1.640 / 13.6) / 517]) \\ &= 76.960 \end{aligned}$$

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

impinger catch (mls): -1
silica gel (g) 14.0
total: 13.2

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

$$\begin{aligned} &= (0.04707) \times (VI,c) \\ &= 0.04707 \times 13.2 \\ &= 0.621 \end{aligned}$$

Bwo = Proportion by volume of water vapor in gas stream

$$\begin{aligned} &= Vw,std / (Vw,std + Vm,std) \\ &= 0.621 / (0.621 + 76.960) \\ &= 0.008 \end{aligned}$$

Ps = Stack gas static pressure (in. Hg)

$$\begin{aligned} &= St / 13.6 \\ &= -0.60 / 13.6 \\ &= -0.044 \end{aligned}$$

Pa = Absolute stack gas pressure (in. Hg)

$$\begin{aligned} &= Ps + \text{Pbar} \\ &= -0.044 + 30.04 \\ &= 30.00 \end{aligned}$$

MFD = Dry mole fraction of stack gas

$$\begin{aligned} &= 1 - Bwo \\ &= 1 - 0.008 \\ &= 0.992 \end{aligned}$$

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

$$\begin{aligned} &= (0.32 \times \%O_2) + (0.44 \times \%CO_2) + (0.28 \times \%N_2) \\ &= (0.32 \times 20.90) + (0.44 \times 0.00) + (0.28 \times 79.10) \\ &= 28.84 \end{aligned}$$

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

$$\begin{aligned} &= (Md) \times (MFD) + (0.18) \times (Bwo \times 100) \\ &= 28.84 \times 0.992 + 0.18 \times 0.80087 \\ &= 28.75 \end{aligned}$$

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)

$$\begin{aligned} &= K_p \times (C_p) \times (\text{sqrt, delta P}) \times \text{sqrt}((T_s + 460^\circ\text{R})/\text{Mw} \times \text{Pa}) \\ &= 85.48 \times 0.84 \times 0.77 \times \text{sqrt}(\quad \quad \quad) \\ &= 42.6 \end{aligned}$$

A Cross sectional areas of stack (sq. ft)

$$\begin{aligned} &= \pi/4 \times d^2 \\ &= 3.14159/4 \times 3.00^2 \\ &= 7.07 \end{aligned}$$

Qa Volumetric flow rate at actual conditions (acfm)

$$\begin{aligned} &= (60 \text{ sec/min}) \times (A) \times (V_s, \text{ avg}) \\ &= 60 \times 7.0686 \times 42.57 \\ &= 18,056 \end{aligned}$$

Qstd Volumetric flow rate at standard conditions (scfm)

$$\begin{aligned} &= Q_a \times (528/T_{s, \text{ avg}} + 460) \times P_a/29.92 \\ &= 18,056 \times (528 / 518) \times 1.003 \\ &= 18,460 \end{aligned}$$

Qstd,dry Volumetric flow rate at dry standard conditions per minute(dscfm)

$$\begin{aligned} &= Q_{\text{std}} \times (1 - B_{\text{wo}}) \\ &= 18,460 \times 0.9920 \\ &= 18,312 \end{aligned}$$

mg/dscm HFPO-DA concentration

$$\begin{aligned} &= (\text{mg/dscf}) \times 35.314 \text{ cu. ft./cu. meter} \\ &= (0.61 / 76.96) \times 35.314 \\ &= 2.79\text{E-}01 \end{aligned}$$

lb/hr HFPO-DA Mass Emission Rate

$$\begin{aligned} &= \text{mg}/1000 / [(453.59 \text{ g/lb}) / (\text{dscf})] \times \text{dscfm} \times 60 \text{ min/hr} \\ &= 0.61 / 1,000 / [453.59 / 76.96] \times 18,314 \times 60 \\ &= 1.92\text{E-}02 \end{aligned}$$

EPA Isokinetic Field Sheet

Methods Performed DD/D

Leak Check Rates	
Sample Rate	Pitot
in. <u>10</u>	cfm <u>+</u>
Initial <u>10</u>	<u>0.005</u>
Mid <u>10</u>	<u>0.005</u>
Mid <u>10</u>	<u>0.007</u>
Final <u>10</u>	<u>0.007</u>

Run Number 1
 Stack Diameter 36"
 Barometric Pres. 30.04
 Static Pressure -0.60
 Meter Box # 3
 Meter delta H 1.004
 Meter Gamma 1.64

Pitot Number P4-2
 Pitot Coefficient 0.84
 Stack TC I.D. 7.50
 Oven Box I.D. 2
 Impinger Out I.D. 1.5
 Nozzle Size 245
 XAD Trap I.D. NA

Client Chemors
 Location Fayetteville, NC
 Source RED VENT IN
 Date 12/19/20
 Operators 3RW
 Start Time 10:50
 End Time 12:47

$K=3.3$

Sample Point	Time (min)	Velocity Head (in. H ₂ O)	Orifice Setting (in. H ₂ O)	Meter Volume (ft ³)	Temperature Readings in Degrees Fahrenheit				Vacuum (in. hg)	Comments/Notes			
					Stack	Probe	Oven Box	Impinger			Aux	Meter Inlet	Meter Outlet
1	4	0.72	2.38	283.56	56	65	64	49	45	48	44	6	
2	8	0.72	2.38	286.9	57	66	65	45	43	52	44	6	
3	12	0.62	2.04		57	68	68	45	43	57	46	5	
4	16	0.62	2.04	293.7	56	67	65	45	42	58	46	5	
5	20	0.62	2.04		56	67	64	43	40	60	48	5	
6	24	0.64	2.11	300.1	56	68	65	41	40	62	49	6	
7	28	0.64	2.11	302.3	56	68	65	41	40	62	49	6	
8	32	0.50	1.65	306.6	57	68	66	40	40	62	50	6	
9	36	0.50	1.45	309.6	57	69	65	40	39	63	51	6	
10	40	0.49	1.67	312.4	57	68	66	40	39	63	52	5	
11	44	0.49	1.67	314.9	57	68	66	40	40	63	52	5	
12	48	0.49	1.67	317.5	57	68	67	39	39	63	53	5	
1	52	0.49	1.67	320.207	57	68	67	39	40	64	53	6	Stop: 11:38
2	56	0.64	2.11	320.457	58	68	73	39	39	60	55	5	Start: 11:57
3	60	0.64	2.11	323.6	58	68	69	37	38	61	55	6	
4	64	0.64	1.98	327.2	58	68	68	37	38	63	55	6	
5	68	0.64	1.98	329.4	58	68	64	38	37	64	56	6.5	
6	72	0.59	1.95	331.1	59	68	68	39	37	65	57	6	
7	76	0.62	2.04	336.4	59	69	68	39	38	65	57	6	
8	80	0.62	2.04	339.8	59	68	67	39	38	65	57	6	
9	84	0.54	1.45	342.8	59	68	65	40	38	65	57	6	
10	88	0.54	1.45	346.3	59	68	66	40	39	65	58	6	
11	92	0.60	1.98	349.2	60	68	66	40	39	65	58	6	
12	94	0.53	1.75	352.5	60	69	65	40	39	64	58	6	
	96	0.53	1.75	355.3	60	68	65	41	39	65	58	5.5	
		0.53	1.75	357.5	60	67	66	42	39	64	58	5.5	
		0.53	1.75	358.215	60	68	67	42	39	65	58	5.5	

Impinging 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	



EPA Isokinetic Field Sheet

Methods Performed 0010

Initial	Leak Check Rates	
	Sample Rate in. cfm	Pitot + -
Mid	10	0.005
Mid	10	0.002
Final	10	0.002

Run Number 2
 Stack Diameter 36"
 Barometric Pres. 30.04
 Static Pressure -0.60
 Meter Box # 3
 Meter delta H 1.004
 Meter Gamma 1.64

Pitot Number P42
 Pitot Coefficient 0.84
 Stack TC I.D. TC5D
 Oven Box I.D. 2
 Impinger Out I.D. 11
 Nozzle Size
 XAD Trap I.D.

Client Champion
 Location Fayerkville, NC
 Source VAN 1A
 Date 12/19/20
 Operators Jim/BK
 Start Time 1430
 End Time 1623

KE-3-3

Sample Point	Sample Time (min)	Velocity Head (in. H ₂ O)	Orifice Setting (in. H ₂ O)	Meter Volume (ft ³)	Temperature Readings in Degrees Fahrenheit				Vacuum (in. hg)	Comments/Notes					
					Stack	Probe	Oven Box	Impinger			Aux	Meter Inlet	Meter Outlet		
1	4	0.73	2.41	358.369	63	68	67	46	37	58	57	0.5			
2	8	0.73	2.41	361.7	65	68	66	44	34	59	57	6			
3	12	0.71	2.34	364.9	63	68	66	42	34	62	57	6			
4	16	0.66	2.18	368.1	63	68	66	40	36	63	57	6			
5	20	0.62	2.04	371.5	63	68	66	39	36	64	57	7			
6	24	0.59	1.95	374.6	63	68	67	38	37	64	57	6			
7	28	0.59	1.95	380.9	63	68	67	38	38	64	58	6			
8	32	0.49	1.67	385.9	63	67	68	38	39	64	58	5.5			
9	36	0.49	1.67	385.9	63	67	68	38	38	64	58	5.5			
10	40	0.42	1.39	387.1	63	68	67	38	37	64	58	5			
11	44	0.44	1.45	389.5	63	68	68	38	38	64	58	5.5			
12	48	0.44	1.45	394.987	63	68	68	38	38	64	58	5.5	392.4 2100		
1	52	0.59	1.95	397.2	64	68	67	43	40	58	57	4.5	514 1535		
2	56	0.59	1.95	401.3	64	68	67	37	38	63	57	5.5			
3	60	0.59	1.95	405.2	64	68	68	37	37	65	60	5.5			
4	64	0.56	1.85	410.9	64	68	68	39	39	65	58	5.5			
5	68	0.56	1.85	413.8	64	68	68	40	39	66	58	6			
6	72	0.56	1.85	417.0	64	68	68	40	39	65	58	6.5			
7	76	0.56	1.85	420.1	63	68	68	41	39	65	59	6			
8	80	0.64	2.11	423.6	64	68	68	40	38	66	59	6			
9	84	0.64	2.11	426.4	64	68	67	40	40	66	59	5.5			
10	88	0.62	2.11	429.7	64	68	67	40	39	66	59	5.5			
11	92	0.64	2.11	431.0	64	68	68	40	38	66	59	5.5			
12	96	0.64	2.11	432.706	64	68	68	40	39	66	59	5.5			

Silica Gel Data (gm)	
#	Initial Final
1	
2	

Moisture Gain	
#	ml. gm. Total
1	
2	

Filter Data	
#	Number Tare
1	
2	
3	

Molecular Weight Data (%)	
#	O ₂ CO ₂
1	
2	
3	
Avg	



EPA Isokinetic Field Sheet

Methods Performed 0010

Leak Check Rates	
Sample Rate	Pitot
in. cfm	+
10 0.007	✓
10 0.005	
10 0.005	
10 0.007	✓

Pitot Number	<u>04-2</u>
Pitot Coefficient	<u>.84</u>
Stack TC I.D.	<u>TC 511</u>
Oven Box I.D.	<u>2</u>
Impinger Out I.D.	<u>11</u>
Nozzle Size	<u>.245</u>
XAD Trap I.D.	<u> </u>

Run Number	<u>3</u>
Stack Diameter	<u>36"</u>
Barometric Pres.	<u>30.01</u>
Static Pressure	<u>-0.60</u>
Meter Box #	<u>3</u>
Meter delta H	<u>1.001</u>
Meter Gamma	<u>1.64</u>

Client	<u>Chemours</u>
Location	<u>Langstonville, NC</u>
Source	<u>VEV, in</u>
Date	<u>12/19/20</u>
Operators	<u>SLW/JBT</u>
Start Time	<u>1057</u>
End Time	<u>1850</u>

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	

Sample Point	Sample Time (min)	Velocity Head (in. H ₂ O)	Orifice Setting (in. H ₂ O)	Meter Volume (ft ³)	Temperature Readings in Degrees Fahrenheit			Impinger	Meter Inlet	Meter Outlet	Vacuum (in. hg)	Comments/Notes
					Stack	Probe	Oven Box					
1	4	0.66	2.18	432.95	63	68	71	45	58	57	9	
2	8	0.65	2.15	436.2	63	65	68	43	60	57	9.5	
3	12	0.62	2.04	439.1	63	68	69	42	62	57	9.5	
4	16	0.62	2.04	442.7	63	68	69	40	64	58	9.5	
5	20	0.60	1.98	445.6	62	68	68	39	61	57	9.5	
6	24	0.60	1.98	448.9	61	67	67	39	64	58	9	
7	28	0.55	1.82	451.9	62	67	74	38	64	57	9	
8	32	0.49	1.67	455.1	62	68	76	37	64	59	8.5	
9	34	0.47	1.55	457.2	62	68	71	37	64	57	8	
10	40	0.45	1.49	460.7	62	68	68	36	64	57	8	
11	44	0.45	1.49	463.6	61	68	68	36	64	57	8	
12	48	0.46	1.52	466.3	60	68	68	37	64	57	7.5	
1	52	0.65	2.15	468.9	60	68	68	36	64	57	7.5	Start 1745
2	56	0.61	2.01	472.01	61	70	62	36	64	57	7.5	Start 1802
3	60	0.60	1.98	475.5	60	65	68	34	61	55	9	
4	64	0.60	1.98	478.5	61	68	69	36	62	55	9	
5	68	0.61	2.01	481.8	61	68	67	35	63	55	9	
6	72	0.60	1.98	484.7	60	65	68	36	63	56	9	
7	76	0.60	1.98	487.9	60	68	69	36	63	56	9	
8	80	0.60	1.98	491.0	60	68	67	37	62	55	9	
9	84	0.60	1.98	494.3	60	68	68	37	62	56	9	
10	88	0.60	1.98	497.6	60	68	68	37	62	56	8.5	
11	92	0.60	1.98	500.7	61	68	68	37	62	56	9	
12	94	0.60	1.98	503.6	60	68	68	38	62	55	9	
96				505.2	61	68	68	38	62	56	9	
				506.798	61	67	68	38	62	55	9	



Sample Train Recovery Data Sheet

Client Chemours Location Fayetteville Source VEN Inlet Method 0010 Date 12/8/20

Run # 1

	Final ml or gm	Initial ml or gm	Net Gain	
Impinger #1	498.6	498.6	_____	Filter #1 _____
Impinger #2	718.9	720.2	_____	Filter #2 _____
Impinger #3	750.7	751.3	_____	Filter #3 _____
Impinger #4	490.7	489.6	_____	
Impinger #5	892.0	878.0	_____	
Impinger #6	_____	_____	_____	
Impinger #7	_____	_____	_____	Run Start Time _____
Impinger #8	_____	_____	_____	Run End Time _____
		Total Gain	_____ ml/gm	Recovery Technician _____

Run # 2

	Final ml or gm	Initial ml or gm	Net Gain	
Impinger #1	499.1	499.3	_____	Filter #1 _____
Impinger #2	749.9	752.1	_____	Filter #2 _____
Impinger #3	646.7	647.0	_____	Filter #3 _____
Impinger #4	520.4	519.1	_____	
Impinger #5	848.5	837.1	_____	
Impinger #6	_____	_____	_____	
Impinger #7	_____	_____	_____	Run Start Time _____
Impinger #8	_____	_____	_____	Run End Time _____
		Total Gain	_____ ml/gm	Recovery Technician _____

Run # 3

	Final ml or gm	Initial ml or gm	Net Gain	
Impinger #1	499.2	499.2	_____	Filter #1 _____
Impinger #2	761.9	764.2	_____	Filter #2 _____
Impinger #3	706.7	706.5	_____	Filter #3 _____
Impinger #4	492.5	491.0	_____	
Impinger #5	882.7	869.9	_____	
Impinger #6	_____	_____	_____	
Impinger #7	_____	_____	_____	Run Start Time _____
Impinger #8	_____	_____	_____	Run End Time _____
		Total Gain	_____ ml/gm	Recovery Technician _____



VEN Carbon Bed Outlet Field Test Data

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

Traverse Point	Run 1						Run 2						Run 3								
	Stack Temp(F)	Delta P	Delta H		Tm(F)		SQR T	Stack Temp(F)	Delta P	Delta H		Tm(F)		SQR T	Stack Temp(F)	Delta P	Delta H		Tm(F)		SQR T
			in	out	in	out				in	out	in	out				Delta P				
A1	61	1.00	3.10	46	46	1.0000	66	1.05	3.25	58	58	1.0247	72	1.05	3.25	60	59			1.0247	
2	61	0.96	2.97	52	46	0.9798	66	1.00	3.10	62	58	1.0000	72	1.05	3.25	65	60			1.0247	
3	61	0.92	2.85	56	47	0.9592	66	0.98	3.03	64	59	0.9899	71	1.05	3.25	67	60			1.0247	
4	62	0.92	2.85	58	48	0.9592	66	0.95	2.94	66	60	0.9747	71	1.00	3.10	68	60			1.0000	
5	62	0.90	2.79	60	49	0.9487	66	0.92	2.85	67	60	0.9592	71	1.00	3.10	68	60			1.0000	
6	62	0.90	2.79	61	50	0.9487	66	0.92	2.85	68	60	0.9592	70	0.90	2.79	68	60			0.9487	
7	62	0.81	2.51	61	51	0.9000	66	0.85	2.63	70	61	0.9220	70	0.82	2.54	68	60			0.9055	
8	62	0.75	2.32	62	52	0.8660	66	0.79	2.44	71	62	0.8888	70	0.80	2.48	68	59			0.8944	
9	61	0.58	1.79	63	53	0.7616	66	0.75	2.32	71	62	0.8660	69	0.71	2.20	68	59			0.8426	
10	60	0.43	1.33	63	53	0.6557	66	0.68	2.10	71	62	0.8246	67	0.55	1.70	68	59			0.7416	
11	60	0.38	1.17	63	54	0.6164	65	0.54	1.67	72	62	0.7348	66	0.50	1.55	68	59			0.7071	
12	60	0.35	1.08	63	54	0.5916	65	0.35	1.08	71	62	0.5916	66	0.37	1.14	68	59			0.6083	
B1	61	0.75	2.32	59	56	0.8660	67	0.95	2.94	62	62	0.9747	65	0.93	2.88	58	57			0.9644	
2	63	0.92	2.85	64	56	0.9592	67	1.05	3.25	69	62	1.0247	67	1.10	3.41	62	57			1.0488	
3	63	1.05	3.25	66	57	1.0247	68	1.10	3.41	71	62	1.0488	69	1.10	3.41	65	57			1.0488	
4	63	1.10	3.41	67	57	1.0488	68	1.10	3.41	71	62	1.0488	68	1.10	3.41	66	57			1.0488	
5	63	1.10	3.41	67	58	1.0488	68	1.05	3.25	71	63	1.0247	68	1.10	3.41	66	57			1.0488	
6	63	1.05	3.25	67	58	1.0247	68	1.05	3.25	72	63	1.0247	68	1.05	3.25	66	57			1.0247	
7	63	1.05	3.25	68	57	1.0247	68	1.05	3.25	72	63	1.0247	68	1.00	3.10	66	57			1.0000	
8	64	0.95	2.94	68	59	0.9747	68	0.97	3.00	72	63	0.9849	68	0.93	2.88	66	57			0.9644	
9	64	0.90	2.79	68	59	0.9487	68	0.91	2.82	72	63	0.9539	68	0.88	2.72	66	57			0.9381	
10	64	0.82	2.54	69	60	0.9055	68	0.91	2.82	72	63	0.9539	68	0.88	2.72	66	57			0.9381	
11	64	0.79	2.44	69	60	0.8888	69	0.88	2.72	72	63	0.9381	68	0.84	2.60	67	57			0.9165	
12	64	0.75	2.32	70	60	0.8660	69	0.80	2.48	72	63	0.8944	68	0.84	2.60	67	57			0.9165	
						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	
						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	
						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	62	0.84	2.60	63	54	0.9070	67	0.90	2.79	69	62	0.9430	69	0.90	2.78	66	58			0.9408	



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

<u>Parameter</u>	<u>Run 1</u>	<u>Run 2</u>	<u>Run 3</u>
Run Date	12/9/20	12/9/20	12/9/20
Start/Stop Time	1050-1245	1430-1623	1657-1850
Duration of Run, Minutes	96	96	96
Ave. Nozzle Diameter, inches	0.245	0.245	0.245
Pitot Calibration Factor, CF	0.84	0.84	0.84
Meter Gamma	0.975	0.975	0.975
Meter Delta H, inches of H2O	1.56	1.56	1.56
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	30.04	30.04	30.04
Static Pressure, inches of H2O	3.4	3.4	3.4
<u>Dry Gas Meter Sample Volume, (VM)ft³</u>			
Initial	991.432	84.453	181.439
Final	1083.644	180.906	277.063
Total Volume	92.115	96.198	98.408
Ave. Stack Temperature, Ts(F)	62.2	66.9	68.7
Ave. Meter Temperature, Tm(F)	58.5	65.4	62.1
Ave. Run Delta H, inches of H2O	2.60	2.79	2.78
Ave. Square Root of Delta P	0.9070	0.9430	0.9408
<u>Moisture Data</u>			
Volume of water collected, mls	3.1	-1.5	-1.3
Silica Gel, grams	14.1	17.2	14
Total Collected, mls	17.2	15.7	12.7
<u>ORSAT Data</u>			
%O2	20.90	20.90	20.90
%CO2	0.0	0.0	0.0
%CO			

Calculations

Vw(std), scf =	0.810	0.739	0.598
Vm(std), dscf =	92.400	95.289	98.075
Bws =	0.009	0.008	0.006
Md =	28.84	28.84	28.84
Ms =	28.74	28.75	28.77
Vs, ft/sec =	50.4	52.7	52.6
Qs, acfm =	21,393	22,339	22,318
Qs(std), dscfm =	21,708	22,487	22,429
Isokinetic Sampling Rate, %	95.7	95.3	98.3

Where:

An = area of the nozzle

As = area of the stack

Vw(std) = volume of water vapor in gas, standard conditions = $0.04707 \cdot Vlc$

Vm(std) = vol. of gas sampled, standard conditions = $17.647 \cdot Vm \cdot \gamma \cdot [Pb + (dH/13.6)] / Tm(R)$

Bws = water vapor in gas stream, proportion by volume = $Vw(std) / (Vm(std) + Vw(std))$

Md = molecular weight of stack gas, dry basis = $(0.44 \cdot \%CO_2) + (0.32 \cdot \%O_2) + [0.28 \cdot (\%N_2 + \%CO)]$

Ms = molecular weight of stack gas, wet basis = $[Md \cdot (1-Bws)] + (18.0 \cdot Bws)$

Vs = stack gas velocity = $85.49 \cdot Cp \cdot (\text{avg. Sq.Rt. dP}) \cdot [Sq.Rt. (Ts(R)) / (Ms \cdot Ps)]$

Qs = stack gas flow rate = $Vs \cdot As \cdot 60$

Qs(std) = stack gas flow rate, standard conditions = $Qs \cdot (1-Bws) \cdot (528 / (Ts(R))) \cdot (Ps / 29.92)$

Isokinetic sampling rate = $\{ (Ts(R)) \cdot [(0.00267 \cdot Vlc) + (Vm(std) / 17.647)] \cdot 100 \} / (\text{Time} \cdot vs \cdot Ps \cdot An \cdot x60)$

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	0.00201	7.69E-04	5.60E-05	6.25E-05	0.00166	6.14E-04	4.47E-05	5.17E-05	0.00932	3.35E-03	2.44E-04	2.82E-04	0.00	1.58E-03	1.15E-04	1.32E-04

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: 991.432
Final gas meter volume: 1083.644
Difference: 92.212

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

= $17.647 \times Vm, a \times \text{Gamma} \times [\text{Pbar} + (\text{DeltaH}/13.6)] / Tm(R)$
= $17.647 \times 92.212 \times 0.975 \times (30.04 + [(1.560 / 13.6)] / 519)$
= 92.400

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

impinger catch (mls): 3
silica gel (g) 14.1
total: 17.2

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

= $(0.04707) \times (VI,c)$
= 0.04707×17.2
= 0.810

Bwo = Proportion by volume of water vapor in gas stream

= $Vw,std / (Vw,std + Vm,std)$
= $0.81 / (0.81 + 92.400)$
= 0.009

Ps = Stack gas static pressure (in. Hg)

= $St / 13.6$
= $3.40 / 13.6$
= 0.250

Pa = Absolute stack gas pressure (in. Hg)

= $Ps + \text{Pbar}$
= $0.250 + 30.04$
= 30.29

MFD = Dry mole fraction of stack gas

= $1 - Bwo$
= $1 - 0.009$
= 0.991

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

= $(0.32 \times \%O_2) + (0.44 \times \%CO_2) + (0.28 \times \%N_2)$
= $(0.32 \times 20.90) + (0.44 \times 0.00) + (0.28 \times 79.10)$
= 28.84

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

= $(Md) \times (MFD) + (0.18) \times (Bwo \times 100)$
= $28.84 \times 0.991 + 0.18 \times 0.86858$
= 28.74

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)

$$\begin{aligned} &= K_p \times (C_p) \times (\text{sqrt, delta P}) \times \text{sqrt}((T_s + 460^\circ\text{R})/\text{Mw} \times \text{Pa}) \\ &= 85.48 \times 0.84 \times 0.91 \times \text{sqrt}(\quad \quad \quad) \\ &= 50.4 \end{aligned}$$

A Cross sectional areas of stack (sq. ft)

$$\begin{aligned} &= \pi/4 \times d^2 \\ &= 3.14159/4 \times 3.00^2 \\ &= 7.07 \end{aligned}$$

Qa Volumetric flow rate at actual conditions (acfm)

$$\begin{aligned} &= (60)\text{sec}/\text{min} \times (A) \times (V_s, \text{avg}) \\ &= 60 \times 7.0686 \times 50.44 \\ &= 21,391 \end{aligned}$$

Qstd Volumetric flow rate at standard conditions (scfm)

$$\begin{aligned} &= Q_a \times (528/T_{s, \text{avg}} + 460) \times P_a/29.92 \\ &= 21,391 \times (528 / 522) \times 1.012 \\ &= 21,896 \end{aligned}$$

Qstd,dry Volumetric flow rate at dry standard conditions per minute(dscfm)

$$\begin{aligned} &= Q_{\text{std}} \times (1 - B_{\text{wo}}) \\ &= 21,896 \times 0.9913 \\ &= 21,706 \end{aligned}$$

mg/dscm HFPO-DA concentration

$$\begin{aligned} &= (\text{mg}/\text{dscf}) \times 35.314 \text{ cu. ft.}/\text{cu. meter} \\ &= (0.00 / 92.40) \times 35.314 \\ &= 7.69\text{E-}04 \end{aligned}$$

lb/hr HFPO-DA Mass Emission Rate

$$\begin{aligned} &= \text{mg}/1000 / [(453.59 \text{ g}/\text{lb}) / (\text{dscf})] \times \text{dscfm} \times 60 \text{ min}/\text{hr} \\ &= 0.00 / 1,000 / [(453.59) / 92.40] \times 21,708 \times 60 \\ &= 6.25\text{E-}05 \end{aligned}$$

EPA Isokinetic Field Sheet

Methods Performed 0510

Client Charmois
 Location Essexville NJ
 Source VEN-OUTLET
 Date 12/9/20
 Operators EA/AA
 Start Time 1050 / 1157
 End Time 1130 / 1245

Run Number 1
 Stack Diameter 36
 Barometric Pres. 30.04
 Static Pressure 3.4
 Meter Box # 8
 Meter delta H 1.56
 Meter Gamma 0.975

Pitot Number PA-3
 Pitot Coefficient 0.84
 Stack TC I.D. 14-3
 Oven Box I.D. 08-5
 Impinger Out I.D. 10-1
 Nozzle Size .245
 XAD Trap I.D. N/A

3.1

Leak Check Rates	
Sample Rate	Pitot
in.	cfm
Initial <u>10</u>	<u>0.006</u>
Mid <u>9</u>	<u>0.005</u>
Mid <u>9</u>	<u>0.006</u>
Final <u>10</u>	<u>1.003</u>

Impinging 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	

Sample Point	Sample Time (min)	Velocity Head (in. H ₂ O)	Orifice Setting (in. H ₂ O)	Meter Volume (ft ³)	Temperature Readings in Degrees Fahrenheit				Vacuum (in. hg)	Comments/Notes			
					Stack	Probe	Oven Box	Impinger			Aux	Meter Inlet	Meter Outlet
1	4	1.0	3.1	991.432	61	83	80	49	44	46	46	5	
2	8	0.96	2.97	985.2	61	69	67	48	44	52	46	5	
3	12	0.92	2.85	999.4	61	68	68	48	40	56	47	5	
4	16	0.92	2.85	1003.5	62	68	68	45	40	58	48	5	
5	20	0.90	2.79	1007.5	62	69	68	44	41	60	49	5	
6	24	0.90	2.79	1111.5	62	69	68	43	42	61	50	5	
7	28	0.81	2.51	—	62	69	68	43	43	61	51	5	
8	32	0.75	2.32	1019.5	62	69	68	43	44	62	52	5	
9	36	0.58	1.79	1023.1	61	68	68	47	44	63	53	5	
10	40	0.43	1.33	1026.5	60	71	71	43	45	63	53	5	
11	44	0.38	1.17	1029.3	60	71	72	43	44	63	54	4	
12	48	0.35	1.08	1031.9	60	71	72	41	45	63	54	4	
1	52	0.75	2.32	1034.63	61	71	72	44	49	59	56	5	1034.525
2	56	0.92	2.55	—	63	71	72	37	47	64	56	5	1034.510
3	1:00	1.05	3.25	1042.1	63	71	72	40	45	66	57	5	
4	1:04	1.1	3.41	1046.7	63	71	72	41	48	67	57	5	
5	1:08	1.1	3.41	1050.9	63	71	72	42	45	67	58	5	
6	1:12	1.05	3.25	1055.1	63	71	72	42	45	67	58	5	
7	1:16	1.05	3.25	1059.7	63	71	72	42	46	68	58	5	
8	1:20	0.95	2.94	1065.9	64	71	72	42	47	68	59	5	
9	1:24	0.90	2.79	1068.0	64	71	72	42	46	68	59	5	
10	1:28	0.82	2.54	1072.2	64	71	72	42	47	69	60	5	
11	1:32	0.79	2.44	1076.1	64	71	72	42	47	69	60	5	
12	1:36	0.75	2.32	1079.9	64	71	72	42	47	70	60	5	
				1083.644									



EPA Isokinetic Field Sheet

Methods Performed 0010

Client	<u>Chemours</u>	Run Number	<u>2</u>	Pitot Number	<u>P4-3</u>
Location	<u>Fayetteville RI</u>	Stack Diameter	<u>36"</u>	Pitot Coefficient	<u>0.84</u>
Source	<u>VED - OUTLET</u>	Barometric Pres.	<u>30.04</u>	Stack TC I.D.	<u>14-3</u>
Date	<u>12/9/20</u>	Static Pressure	<u>3.4</u>	Oven Box I.D.	<u>08.5</u>
Operators	<u>EX/AA</u>	Meter Box #	<u>8</u>	Impinger Out I.D.	<u>0.008 ID-11</u>
Start Time	<u>1430 / 1535</u>	Meter delta H	<u>1.52</u>	Nozzle Size	<u>1.245</u>
End Time	<u>1518 / 1623</u>	Meter Gamma	<u>0.925</u>	XAD Trap I.D.	<u>3.1</u>

Leak Check Rates	
Sample Rate	Pitot
in.	cfm
Initial	12 0.107
Mid	10 0.006
Mid	10 0.004
Final	10 0.007

Sample Point	Sample Time (min)	Velocity Head (in. H ₂ O)	Orifice Setting (in. H ₂ O)	Meter Volume (ft ³)	Temperature Readings in Degrees Fahrenheit				Vacuum (in. hg)	Comments/Notes		
					Stack	Probe	Oven Box	Impinger			Aux	Meter Inlet
1	4	1.05	3.25	84.453	66	71	72	46	58	58	7	
2	8	1.0	3.1	88.5	66	71	72	45	58	58	7	
3	12	0.98	3.03	92.9	66	71	72	47	59	59	7	
4	16	0.95	2.94	97.2	66	71	72	48	60	60	7	
5	20	0.92	2.85	101.4	66	71	73	49	60	60	7	
6	24	0.92	2.85	-	66	70	75	49	60	60	7	
7	28	0.85	2.63	109.6	66	72	72	46	61	61	7	
8	32	0.79	2.44	113.6	66	71	71	49	62	62	7	
9	36	0.75	2.32	-	66	73	74	49	62	62	7	
10	40	0.68	2.10	121.2	66	73	77	49	62	62	6	
11	44	0.54	1.67	124.7	65	73	75	48	62	62	6	
12	48	0.35	1.08	127.8	65	73	73	48	62	62	5	130.545
1	52	0.95	2.94	130.700	67	77	79	51	62	62	7	LK-01155
2	56	1.05	3.25	134.5	67	73	76	45	62	62	8	
3	1:00	1.1	3.41	138.8	68	73	76	47	62	62	8	
4	1:04	1.1	3.41	-	68	73	75	50	62	62	8	
5	1:08	1.05	3.25	-	68	74	75	50	63	63	8	
6	1:12	1.05	3.25	152.0	68	71	75	51	63	63	8	
7	1:14	1.05	3.25	156.3	68	74	75	52	63	63	8	
8	1:20	0.97	3.0	160.8	68	74	75	53	63	63	8	
9	1:24	0.91	2.82	164.8	68	75	76	53	63	63	8	
10	1:28	0.91	2.82	-	68	75	76	54	63	63	8	
11	1:32	0.88	2.72	173.0	69	75	77	55	63	63	8	
12	1:36	0.80	2.46	177.1	69	75	74	55	63	63	8	
				180.706								

Impinging 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	



EPA Isokinetic Field Sheet

Methods Performed Q10

Client Citizens Environmental NL
 Location VEN - 001 - 01
 Source FAA
 Date 12/19/20
 Operators 1657 / 1802
 Start Time 12:57
 End Time 1:14

Run Number 3
 Stack Diameter 36
 Barometric Pres. 30.04
 Static Pressure 3.4
 Meter Box # 8
 Meter delta H 1.56
 Meter Gamma 0.975

Pitot Number P4-3
 Pitot Coefficient 0.84
 Stack TC I.D. P433
 Oven Box I.D. 0.65
 Impinger Out I.D. 10-11
 Nozzle Size 0.215
 XAD Trap I.D. 3.1

Leak Check Rates		
Sample Rate	Pitot	
in.	cfm	+
Initial <u>10</u>	<u>0.007</u>	<input type="checkbox"/>
Mid <u>10</u>	<u>0.006</u>	<input checked="" type="checkbox"/>
Mid <u>11</u>	<u>0.004</u>	<input checked="" type="checkbox"/>
Final <u>10</u>	<u>0.006</u>	<input checked="" type="checkbox"/>

Sample Point	Sample Time (min)	Velocity (in. H ₂ O)	Orifice Setting (in. H ₂ O)	Meter Volume (ft ³)	Temperature Readings in Degrees Fahrenheit			Vacuum (in. hg)	Comments/Notes
					Stack	Oven Probe	Impinger		
1	4	1.05	3.25	181.439	72	80	50	7	
2	8	1.05	3.25	185.5	72	81	41	7	
3	12	1.05	3.25	189.5	71	80	44	7	
4	16	1.0	3.1	184.1	71	80	44	7	
5	20	1.0	3.1	198.4	71	81	44	7	
6	24	0.90	2.79	202.7	70	82	43	7	
7	28	0.82	2.54	206.8	70	82	44	7	
8	32	0.80	2.48	210.1	70	83	44	7	
9	36	0.71	2.20	214.4	69	83	43	6	
10	40	0.55	1.70	218.0	67	81	44	6	
11	44	0.50	1.55	221.3	66	83	43	6	
12	48	0.37	1.14	224.3	66	79	43	5	226.946
1	52	0.93	2.88	221.202	65	85	45	7	
2	56	1.1	3.41	235.3	67	79	40	8	14.66.0.216
3	1:00	1.1	3.41	244.2	67	79	41	8	
4	1:04	1.1	3.41	249.5	68	79	42	8	
5	1:08	1.05	3.25	251.1	68	79	43	8	
6	1:12	0.93	2.72	261.2	68	79	43	8	
7	1:16	0.88	2.72	265.2	68	79	43	8	
8	1:20	0.84	2.60	277.063	68	80	42	8	
9	1:24	0.84	2.60						
10	1:28	0.84	2.60						
11	1:32	0.84	2.60						
12	1:36	0.84	2.60						

Impinging 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	



Sample Train Recovery Data Sheet

Client Chemours Location Fayetteville Source VEU OUTLET Method 0010 Date 12/9/20

Run # 1

	Final ml or gm	Initial ml or gm	Net Gain
Impinger #1	<u>516.5</u>	<u>513.8</u>	_____
Impinger #2	<u>741.2</u>	<u>743.6</u>	_____
Impinger #3	<u>768.8</u>	<u>769.5</u>	_____
Impinger #4	<u>509.2</u>	<u>507.1</u>	_____
Impinger #5	<u>863.2</u>	<u>849.1</u>	_____
Impinger #6	_____	_____	_____
Impinger #7	_____	_____	_____
Impinger #8	_____	_____	_____
		Total Gain	_____ ml/gm

Filter #1 0010

Filter #2 _____

Filter #3 _____

Run Start Time _____

Run End Time _____

Recovery Technician PG

Run # 2

	Final ml or gm	Initial ml or gm	Net Gain
Impinger #1	<u>468.7</u>	<u>468.7</u>	_____
Impinger #2	<u>730.9</u>	<u>731.9</u>	_____
Impinger #3	<u>684.9</u>	<u>686.5</u>	_____
Impinger #4	<u>477.9</u>	<u>476.8</u>	_____
Impinger #5	<u>786.5</u>	<u>769.3</u>	_____
Impinger #6	_____	_____	_____
Impinger #7	_____	_____	_____
Impinger #8	_____	_____	_____
		Total Gain	_____ ml/gm

Filter #1 0010

Filter #2 _____

Filter #3 _____

Run Start Time _____

Run End Time _____

Recovery Technician PG

Run # 3

	Final ml or gm	Initial ml or gm	Net Gain
Impinger #1	<u>515.2</u>	<u>508.5</u> ^{PG} <u>515.0</u>	_____
Impinger #2	<u>751.0</u>	<u>753.6</u>	_____
Impinger #3	<u>761.6</u>	<u>761.8</u>	_____
Impinger #4	<u>509.8</u>	<u>508.5</u>	_____
Impinger #5	<u>876.8</u>	<u>862.8</u>	_____
Impinger #6	_____	_____	_____
Impinger #7	_____	_____	_____
Impinger #8	_____	_____	_____
		Total Gain	_____ ml/gm

Filter #1 0010

Filter #2 _____

Filter #3 _____

Run Start Time _____

Run End Time _____

Recovery Technician PG

APPENDIX D LABORATORY DATA

VEN Carbon Bed Inlet Laboratory Data

ANALYTICAL REPORT

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

Laboratory Job ID: 140-21302-1
Client Project/Site: VEN CB Inlet - M0010

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:
1/6/2021 8:06:43 AM

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

LINKS

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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



Table of Contents

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Client Sample Results	6
Default Detection Limits	9
Isotope Dilution Summary	10
QC Sample Results	11
QC Association Summary	13
Lab Chronicle	15
Certification Summary	20
Method Summary	21
Sample Summary	22
Chain of Custody	23

Definitions/Glossary

Client: The Chemours Company FC, LLC
Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

Qualifiers

LCMS

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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

Case Narrative

Client: The Chemours Company FC, LLC
Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

Job ID: 140-21302-1

Laboratory: Eurofins TestAmerica, Knoxville

Narrative

Job Narrative 140-21302-1

Comments

No additional comments.

Receipt

The samples were received on 12/10/2020 6:25 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.8° 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, ng/sample = (on-column concentration, ng/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 140-45299 and 140-45468 was spilled during sample transfer to concentration thimble. About half of the sample was spilled. The method blank was allowed to continue on through analysis. IDA recovery for 13C6 HFPO-DA was still above QC limits, while 13C4 PFOA was outside QC limits, but with a signal to noise ratio greater than 10:1. This was the second method blank for this batch. The first method blank passed all QC requirements. The samples were consumed during the extraction process, therefore, the data have been reported.

Method 537 (modified): The following samples were reported with elevated reporting limits for all analytes: Z-1164,1165,1167 VEN CB INLET R1 M0010 BH (140-21302-2), Z-1171,1172,1174 VEN CB INLET R2 M0010 BH (140-21302-6) and Z-1178,1179,1181 VEN CB INLET R3 M0010 BH (140-21302-10). The sample was analyzed at a dilution based on screening results.

Method 537 (modified): The required dilution factor for the following samples were higher than could be achieved by "in vial" dilution, as it would dilute out the Isotope Dilution Analytes (IDA): Z-1164,1165,1167 VEN CB INLET R1 M0010 BH (140-21302-2), Z-1171,1172,1174 VEN CB INLET R2 M0010 BH (140-21302-6) and Z-1178,1179,1181 VEN CB INLET R3 M0010 BH (140-21302-10). As such, the dilution was achieved by taking a subsample of the undiluted extract, adding sufficient solvent, and re-spiking the extract with IDA.

Method 537 (modified): The following samples were reported with elevated reporting limits for all analytes: Z-1162,1163 VEN CB INLET R1 M0010 FH (140-21302-1), Z-1169,1170 VEN CB INLET R2 M0010 FH (140-21302-5) and Z-1176,1177 VEN CB INLET R3 M0010 FH (140-21302-9). The sample was analyzed at a dilution based on screening results.

Method 537 (modified): The required dilution factor for the following samples were higher than could be achieved by "in vial" dilution, as it

Case Narrative

Client: The Chemours Company FC, LLC
Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

Job ID: 140-21302-1 (Continued)

Laboratory: Eurofins TestAmerica, Knoxville (Continued)

would dilute out the Isotope Dilution Analytes (IDA): Z-1162,1163 VEN CB INLET R1 M0010 FH (140-21302-1), Z-1169,1170 VEN CB INLET R2 M0010 FH (140-21302-5) and Z-1176,1177 VEN CB INLET R3 M0010 FH (140-21302-9). As such, the dilution was achieved by taking a subsample of the undiluted extract, adding sufficient solvent, and re-spiking the extract with IDA.

Method 537 (modified): The method blank for preparation batch 140-45356 and 140-45592 contained 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.



Client Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

Client Sample ID: Z-1162,1163 VEN CB INLET R1 M0010 FH

Lab Sample ID: 140-21302-1

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	265	B	5.00	2.90	ug/Sample		12/16/20 12:02	01/04/21 15:03	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	97		25 - 150				12/16/20 12:02	01/04/21 15:03	1

Client Sample ID: Z-1164,1165,1167 VEN CB INLET R1 M0010

Lab Sample ID: 140-21302-2

BH

Matrix: Air

Date Collected: 12/09/20 00:00

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	344		16.0	14.0	ug/Sample		12/15/20 14:18	12/24/20 10:12	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	99		25 - 150				12/15/20 14:18	12/24/20 10:12	1

Client Sample ID: Z-1166 VEN CB INLET R1 M0010

Lab Sample ID: 140-21302-3

IMPINGERS 1,2&3 COND

Matrix: Air

Date Collected: 12/09/20 00:00

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0268	J	0.0490	0.00809	ug/Sample		12/22/20 10:02	12/22/20 21:50	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	109		25 - 150				12/22/20 10:02	12/22/20 21:50	1

Client Sample ID: Z-1168 VEN CB INLET R1 M0010

Lab Sample ID: 140-21302-4

BREAKTHROUGH XAD-2 RESIN TUBE

Matrix: Air

Date Collected: 12/09/20 00:00

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.00232		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 13:15	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	84		25 - 150				12/15/20 14:18	12/24/20 13:15	1

Client Sample ID: Z-1169,1170 VEN CB INLET R2 M0010 FH

Lab Sample ID: 140-21302-5

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	264	B	5.00	2.90	ug/Sample		12/16/20 12:02	01/04/21 15:12	1

Eurofins TestAmerica, Knoxville

Client Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

Client Sample ID: Z-1169,1170 VEN CB INLET R2 M0010 FH

Lab Sample ID: 140-21302-5

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	97		25 - 150	12/16/20 12:02	01/04/21 15:12	1

Client Sample ID: Z-1171,1172,1174 VEN CB INLET R2 M0010

Lab Sample ID: 140-21302-6

BH

Matrix: Air

Date Collected: 12/09/20 00:00

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	942		16.0	14.0	ug/Sample		12/15/20 14:18	12/24/20 10:47	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	101		25 - 150	12/15/20 14:18	12/24/20 10:47	1

Client Sample ID: Z-1173 VEN CB INLET R2 M0010

Lab Sample ID: 140-21302-7

IMPINGERS 1,2&3 COND

Matrix: Air

Date Collected: 12/09/20 00:00

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0178	J	0.0495	0.00817	ug/Sample		12/22/20 10:02	12/22/20 21:59	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	110		25 - 150	12/22/20 10:02	12/22/20 21:59	1

Client Sample ID: Z-1175 VEN CB INLET R2 M0010

Lab Sample ID: 140-21302-8

BREAKTHROUGH XAD-2 RESIN TUBE

Matrix: Air

Date Collected: 12/09/20 00:00

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.128		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 13:24	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	87		25 - 150	12/15/20 14:18	12/24/20 13:24	1

Client Sample ID: Z-1176,1177 VEN CB INLET R3 M0010 FH

Lab Sample ID: 140-21302-9

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	309	B	5.00	2.90	ug/Sample		12/16/20 12:02	01/04/21 15:21	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	97		25 - 150	12/16/20 12:02	01/04/21 15:21	1

Eurofins TestAmerica, Knoxville

Client Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

Client Sample ID: Z-1178,1179,1181 VEN CB INLET R3 M0010

Lab Sample ID: 140-21302-10

BH

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	528		16.0	14.0	ug/Sample		12/15/20 14:18	12/24/20 11:16	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	100		25 - 150				12/15/20 14:18	12/24/20 11:16	1

Client Sample ID: Z-1180 VEN CB INLET R3 M0010

Lab Sample ID: 140-21302-11

IMPINGERS 1,2&3 COND

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0226	J	0.0487	0.00804	ug/Sample		12/22/20 10:02	12/22/20 22:08	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	104		25 - 150				12/22/20 10:02	12/22/20 22:08	1

Client Sample ID: Z-1182 VEN CB INLET R3 M0010

Lab Sample ID: 140-21302-12

BREAKTHROUGH XAD-2 RESIN TUBE

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.00690		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 11:25	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	88		25 - 150				12/15/20 14:18	12/24/20 11:25	1

Default Detection Limits

Client: The Chemours Company FC, LLC
Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

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

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Isotope Dilution Summary

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Air

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)	
		HFPODA (25-150)	
140-21302-1	Z-1162,1163 VEN CB INLET R1	97	
140-21302-2	Z-1164,1165,1167 VEN CB INLET R1 M0010 BH	99	
140-21302-3	Z-1166 VEN CB INLET R1 M0010 IMPINGERS 1,2&3 CON	109	
140-21302-4	Z-1168 VEN CB INLET R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	84	
140-21302-5	Z-1169,1170 VEN CB INLET R2 M0010 FH	97	
140-21302-6	Z-1171,1172,1174 VEN CB INLET R2 M0010 BH	101	
140-21302-7	Z-1173 VEN CB INLET R2 M0010 IMPINGERS 1,2&3 CON	110	
140-21302-8	Z-1175 VEN CB INLET R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	87	
140-21302-9	Z-1176,1177 VEN CB INLET R3 M0010 FH	97	
140-21302-10	Z-1178,1179,1181 VEN CB INLET R3 M0010 BH	100	
140-21302-11	Z-1180 VEN CB INLET R3 M0010 IMPINGERS 1,2&3 CON	104	
140-21302-12	Z-1182 VEN CB INLET R3 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	88	
LCS 140-45299/2-B	Lab Control Sample	77	
LCS 140-45356/2-B	Lab Control Sample	80	
LCS 140-45516/2-B	Lab Control Sample	106	
LCSD 140-45299/3-B	Lab Control Sample Dup	64	
LCSD 140-45356/3-B	Lab Control Sample Dup	77	
LCSD 140-45516/3-B	Lab Control Sample Dup	109	
MB 140-45299/14-B	Method Blank	30	
MB 140-45299/1-B	Method Blank	83	
MB 140-45356/1-B	Method Blank	86	
MB 140-45516/1-B	Method Blank	104	

Surrogate Legend

HFPODA = 13C3 HFPO-DA

QC Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 140-45299/14-B
Matrix: Air
Analysis Batch: 45601

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 45299

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 11:06	1
Isotope Dilution	%Recovery	MB Qualifier	MB Limits				Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	30		25 - 150				12/15/20 14:18	12/24/20 11:06	1

Lab Sample ID: MB 140-45299/1-B
Matrix: Air
Analysis Batch: 45601

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 45299

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 08:53	1
Isotope Dilution	%Recovery	MB Qualifier	MB Limits				Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	83		25 - 150				12/15/20 14:18	12/24/20 08:53	1

Lab Sample ID: LCS 140-45299/2-B
Matrix: Air
Analysis Batch: 45601

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 45299

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HFPO-DA	0.0200	0.02114		ug/Sample		106	60 - 140
Isotope Dilution	%Recovery	LCS Qualifier	LCS Limits				
13C3 HFPO-DA	77		25 - 150				

Lab Sample ID: LCSD 140-45299/3-B
Matrix: Air
Analysis Batch: 45601

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 45299

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA	0.0200	0.02185		ug/Sample		109	60 - 140	3	30
Isotope Dilution	%Recovery	LCSD Qualifier	LCSD Limits						
13C3 HFPO-DA	64		25 - 150						

Lab Sample ID: MB 140-45356/1-B
Matrix: Air
Analysis Batch: 45773

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 45356

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.001713		0.00100	0.000580	ug/Sample		12/16/20 12:02	01/04/21 14:10	1
Isotope Dilution	%Recovery	MB Qualifier	MB Limits				Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	86		25 - 150				12/16/20 12:02	01/04/21 14:10	1

QC Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

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

Lab Sample ID: LCS 140-45356/2-B
Matrix: Air
Analysis Batch: 45773

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 45356

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HFPO-DA	0.0200	0.02307		ug/Sample		115	60 - 140
<i>Isotope Dilution</i>		<i>%Recovery</i>	<i>Qualifier</i>				<i>Limits</i>
13C3 HFPO-DA		80					25 - 150

Lab Sample ID: LCSD 140-45356/3-B
Matrix: Air
Analysis Batch: 45773

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 45356

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
HFPO-DA	0.0200	0.02465		ug/Sample		123	60 - 140	7	30
<i>Isotope Dilution</i>		<i>%Recovery</i>	<i>Qualifier</i>				<i>Limits</i>		
13C3 HFPO-DA		77					25 - 150		

Lab Sample ID: MB 140-45516/1-B
Matrix: Air
Analysis Batch: 45544

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 45516

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.000500	0.0000825	ug/Sample		12/22/20 10:02	12/22/20 20:57	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	104		25 - 150				12/22/20 10:02	12/22/20 20:57	1

Lab Sample ID: LCS 140-45516/2-B
Matrix: Air
Analysis Batch: 45544

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 45516

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HFPO-DA	0.0100	0.01110		ug/Sample		111	60 - 140
<i>Isotope Dilution</i>		<i>%Recovery</i>	<i>Qualifier</i>				<i>Limits</i>
13C3 HFPO-DA		106					25 - 150

Lab Sample ID: LCSD 140-45516/3-B
Matrix: Air
Analysis Batch: 45544

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 45516

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
HFPO-DA	0.0100	0.01129		ug/Sample		113	60 - 140	2	30
<i>Isotope Dilution</i>		<i>%Recovery</i>	<i>Qualifier</i>				<i>Limits</i>		
13C3 HFPO-DA		109					25 - 150		

QC Association Summary

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

LCMS

Prep Batch: 45299

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21302-2	Z-1164,1165,1167 VEN CB INLET R1 M0010 BH	Total/NA	Air	None	
140-21302-4	Z-1168 VEN CB INLET R1 M0010 BREAKTHRO	Total/NA	Air	None	
140-21302-6	Z-1171,1172,1174 VEN CB INLET R2 M0010 BH	Total/NA	Air	None	
140-21302-8	Z-1175 VEN CB INLET R2 M0010 BREAKTHRO	Total/NA	Air	None	
140-21302-10	Z-1178,1179,1181 VEN CB INLET R3 M0010 BH	Total/NA	Air	None	
140-21302-12	Z-1182 VEN CB INLET R3 M0010 BREAKTHRO	Total/NA	Air	None	
MB 140-45299/14-B	Method Blank	Total/NA	Air	None	
MB 140-45299/1-B	Method Blank	Total/NA	Air	None	
LCS 140-45299/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-45299/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Prep Batch: 45356

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21302-1	Z-1162,1163 VEN CB INLET R1 M0010 FH	Total/NA	Air	None	
140-21302-5	Z-1169,1170 VEN CB INLET R2 M0010 FH	Total/NA	Air	None	
140-21302-9	Z-1176,1177 VEN CB INLET R3 M0010 FH	Total/NA	Air	None	
MB 140-45356/1-B	Method Blank	Total/NA	Air	None	
LCS 140-45356/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-45356/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Cleanup Batch: 45468

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21302-2	Z-1164,1165,1167 VEN CB INLET R1 M0010 BH	Total/NA	Air	Split	45299
140-21302-4	Z-1168 VEN CB INLET R1 M0010 BREAKTHRO	Total/NA	Air	Split	45299
140-21302-6	Z-1171,1172,1174 VEN CB INLET R2 M0010 BH	Total/NA	Air	Split	45299
140-21302-8	Z-1175 VEN CB INLET R2 M0010 BREAKTHRO	Total/NA	Air	Split	45299
140-21302-10	Z-1178,1179,1181 VEN CB INLET R3 M0010 BH	Total/NA	Air	Split	45299
140-21302-12	Z-1182 VEN CB INLET R3 M0010 BREAKTHRO	Total/NA	Air	Split	45299
MB 140-45299/14-B	Method Blank	Total/NA	Air	Split	45299
MB 140-45299/1-B	Method Blank	Total/NA	Air	Split	45299
LCS 140-45299/2-B	Lab Control Sample	Total/NA	Air	Split	45299
LCSD 140-45299/3-B	Lab Control Sample Dup	Total/NA	Air	Split	45299

Prep Batch: 45516

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21302-3	Z-1166 VEN CB INLET R1 M0010 IMPINGERS 1	Total/NA	Air	None	
140-21302-7	Z-1173 VEN CB INLET R2 M0010 IMPINGERS 1	Total/NA	Air	None	
140-21302-11	Z-1180 VEN CB INLET R3 M0010 IMPINGERS 1	Total/NA	Air	None	
MB 140-45516/1-B	Method Blank	Total/NA	Air	None	
LCS 140-45516/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-45516/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Cleanup Batch: 45531

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21302-3	Z-1166 VEN CB INLET R1 M0010 IMPINGERS 1	Total/NA	Air	Split	45516
140-21302-7	Z-1173 VEN CB INLET R2 M0010 IMPINGERS 1	Total/NA	Air	Split	45516
140-21302-11	Z-1180 VEN CB INLET R3 M0010 IMPINGERS 1	Total/NA	Air	Split	45516
MB 140-45516/1-B	Method Blank	Total/NA	Air	Split	45516
LCS 140-45516/2-B	Lab Control Sample	Total/NA	Air	Split	45516
LCSD 140-45516/3-B	Lab Control Sample Dup	Total/NA	Air	Split	45516

QC Association Summary

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

LCMS

Analysis Batch: 45544

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21302-3	Z-1166 VEN CB INLET R1 M0010 IMPINGERS 1	Total/NA	Air	537 (modified)	45531
140-21302-7	Z-1173 VEN CB INLET R2 M0010 IMPINGERS 1	Total/NA	Air	537 (modified)	45531
140-21302-11	Z-1180 VEN CB INLET R3 M0010 IMPINGERS 1	Total/NA	Air	537 (modified)	45531
MB 140-45516/1-B	Method Blank	Total/NA	Air	537 (modified)	45531
LCS 140-45516/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	45531
LCSD 140-45516/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	45531

Cleanup Batch: 45592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21302-1	Z-1162,1163 VEN CB INLET R1 M0010 FH	Total/NA	Air	Split	45356
140-21302-5	Z-1169,1170 VEN CB INLET R2 M0010 FH	Total/NA	Air	Split	45356
140-21302-9	Z-1176,1177 VEN CB INLET R3 M0010 FH	Total/NA	Air	Split	45356
MB 140-45356/1-B	Method Blank	Total/NA	Air	Split	45356
LCS 140-45356/2-B	Lab Control Sample	Total/NA	Air	Split	45356
LCSD 140-45356/3-B	Lab Control Sample Dup	Total/NA	Air	Split	45356

Analysis Batch: 45601

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21302-2	Z-1164,1165,1167 VEN CB INLET R1 M0010 BH	Total/NA	Air	537 (modified)	45602
140-21302-4	Z-1168 VEN CB INLET R1 M0010 BREAKTHRO	Total/NA	Air	537 (modified)	45468
140-21302-6	Z-1171,1172,1174 VEN CB INLET R2 M0010 BH	Total/NA	Air	537 (modified)	45602
140-21302-8	Z-1175 VEN CB INLET R2 M0010 BREAKTHRO	Total/NA	Air	537 (modified)	45468
140-21302-10	Z-1178,1179,1181 VEN CB INLET R3 M0010 BH	Total/NA	Air	537 (modified)	45602
140-21302-12	Z-1182 VEN CB INLET R3 M0010 BREAKTHRO	Total/NA	Air	537 (modified)	45468
MB 140-45299/14-B	Method Blank	Total/NA	Air	537 (modified)	45468
MB 140-45299/1-B	Method Blank	Total/NA	Air	537 (modified)	45468
LCS 140-45299/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	45468
LCSD 140-45299/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	45468

Cleanup Batch: 45602

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21302-2	Z-1164,1165,1167 VEN CB INLET R1 M0010 BH	Total/NA	Air	Dilution	45468
140-21302-6	Z-1171,1172,1174 VEN CB INLET R2 M0010 BH	Total/NA	Air	Dilution	45468
140-21302-10	Z-1178,1179,1181 VEN CB INLET R3 M0010 BH	Total/NA	Air	Dilution	45468

Cleanup Batch: 45772

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21302-1	Z-1162,1163 VEN CB INLET R1 M0010 FH	Total/NA	Air	Dilution	45592
140-21302-5	Z-1169,1170 VEN CB INLET R2 M0010 FH	Total/NA	Air	Dilution	45592
140-21302-9	Z-1176,1177 VEN CB INLET R3 M0010 FH	Total/NA	Air	Dilution	45592

Analysis Batch: 45773

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21302-1	Z-1162,1163 VEN CB INLET R1 M0010 FH	Total/NA	Air	537 (modified)	45772
140-21302-5	Z-1169,1170 VEN CB INLET R2 M0010 FH	Total/NA	Air	537 (modified)	45772
140-21302-9	Z-1176,1177 VEN CB INLET R3 M0010 FH	Total/NA	Air	537 (modified)	45772
MB 140-45356/1-B	Method Blank	Total/NA	Air	537 (modified)	45592
LCS 140-45356/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	45592
LCSD 140-45356/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	45592

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

Client Sample ID: Z-1162,1163 VEN CB INLET R1 M0010 FH

Lab Sample ID: 140-21302-1

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	104 mL	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			52 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Cleanup	Dilution			2 uL	10000 uL	45772	01/04/21 12:43	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			45773	01/04/21 15:03	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Z-1164,1165,1167 VEN CB INLET R1 M0010

Lab Sample ID: 140-21302-2

BH

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Cleanup	Dilution			1 uL	10000 uL	45602	12/24/20 07:39	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 10:12	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Z-1166 VEN CB INLET R1 M0010

Lab Sample ID: 140-21302-3

IMPINGERS 1,2&3 COND

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.0102 Sample	10 mL	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 21:50	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Z-1168 VEN CB INLET R1 M0010

Lab Sample ID: 140-21302-4

BREAKTHROUGH XAD-2 RESIN TUBE

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 13:15	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

Client Sample ID: Z-1169,1170 VEN CB INLET R2 M0010 FH

Lab Sample ID: 140-21302-5

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	98 mL	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			49 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Cleanup	Dilution			2 uL	10000 uL	45772	01/04/21 12:43	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			45773	01/04/21 15:12	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Z-1171,1172,1174 VEN CB INLET R2 M0010

Lab Sample ID: 140-21302-6

BH

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Cleanup	Dilution			1 uL	10000 uL	45602	12/24/20 07:39	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 10:47	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Z-1173 VEN CB INLET R2 M0010

Lab Sample ID: 140-21302-7

IMPINGERS 1,2&3 COND

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.0101 Sample	10 mL	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 21:59	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Z-1175 VEN CB INLET R2 M0010

Lab Sample ID: 140-21302-8

BREAKTHROUGH XAD-2 RESIN TUBE

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 13:24	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

Client Sample ID: Z-1176,1177 VEN CB INLET R3 M0010 FH

Lab Sample ID: 140-21302-9

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	110 mL	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			55 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Cleanup	Dilution			2 uL	10000 uL	45772	01/04/21 12:43	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			45773	01/04/21 15:21	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Z-1178,1179,1181 VEN CB INLET R3 M0010

Lab Sample ID: 140-21302-10

BH

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Cleanup	Dilution			1 uL	10000 uL	45602	12/24/20 07:39	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 11:16	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Z-1180 VEN CB INLET R3 M0010

Lab Sample ID: 140-21302-11

IMPINGERS 1,2&3 COND

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.01026 Sample	10 mL	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 22:08	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Z-1182 VEN CB INLET R3 M0010

Lab Sample ID: 140-21302-12

BREAKTHROUGH XAD-2 RESIN TUBE

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 11:25	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

Client Sample ID: Method Blank

Lab Sample ID: MB 140-45299/14-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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 11:06	JRC	TAL KNX

Instrument ID: LCA

Client Sample ID: Method Blank

Lab Sample ID: MB 140-45299/1-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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 08:53	JRC	TAL KNX

Instrument ID: LCA

Client Sample ID: Method Blank

Lab Sample ID: MB 140-45356/1-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	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45773	01/04/21 14:10	JRC	TAL KNX

Instrument ID: LCA

Client Sample ID: Method Blank

Lab Sample ID: MB 140-45516/1-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	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 20:57	JRC	TAL KNX

Instrument ID: LCA

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-45299/2-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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 09:02	JRC	TAL KNX

Instrument ID: LCA

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-45356/2-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	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45773	01/04/21 14:19	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-45516/2-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	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 21:06	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-45299/3-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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 09:11	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-45356/3-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	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45773	01/04/21 14:28	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-45516/3-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	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 21:15	JRC	TAL KNX
Instrument ID: LCA										

Laboratory References:

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

Eurofins TestAmerica, Knoxville

Accreditation/Certification Summary

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Inlet - M0010

Job ID: 140-21302-1

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	06-30-21
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	01-01-21 *
Louisiana	NELAP	83979	06-30-21
Louisiana (DW)	State	LA019	12-31-21
Maryland	State	277	03-31-21
Michigan	State	9933	12-11-22
Nevada	State	TN00009	07-31-21
New Hampshire	NELAP	299919	01-17-21
New Jersey	NELAP	TN001	07-01-21
New York	NELAP	10781	03-31-21
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	01-19-21
West Virginia (DW)	State	9955C	01-01-21 *
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 CB Inlet - M0010

Job ID: 140-21302-1

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 CB Inlet - M0010

Job ID: 140-21302-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-21302-1	Z-1162,1163 VEN CB INLET R1 M0010 FH	Air	12/09/20 00:00	12/10/20 06:25	
140-21302-2	Z-1164,1165,1167 VEN CB INLET R1 M0010 BH	Air	12/09/20 00:00	12/10/20 06:25	
140-21302-3	Z-1166 VEN CB INLET R1 M0010 IMPINGERS 1,2&3 COND	Air	12/09/20 00:00	12/10/20 06:25	
140-21302-4	Z-1168 VEN CB INLET R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	12/09/20 00:00	12/10/20 06:25	
140-21302-5	Z-1169,1170 VEN CB INLET R2 M0010 FH	Air	12/09/20 00:00	12/10/20 06:25	
140-21302-6	Z-1171,1172,1174 VEN CB INLET R2 M0010 BH	Air	12/09/20 00:00	12/10/20 06:25	
140-21302-7	Z-1173 VEN CB INLET R2 M0010 IMPINGERS 1,2&3 COND	Air	12/09/20 00:00	12/10/20 06:25	
140-21302-8	Z-1175 VEN CB INLET R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	12/09/20 00:00	12/10/20 06:25	
140-21302-9	Z-1176,1177 VEN CB INLET R3 M0010 FH	Air	12/09/20 00:00	12/10/20 06:25	
140-21302-10	Z-1178,1179,1181 VEN CB INLET R3 M0010 BH	Air	12/09/20 00:00	12/10/20 06:25	
140-21302-11	Z-1180 VEN CB INLET R3 M0010 IMPINGERS 1,2&3 COND	Air	12/09/20 00:00	12/10/20 06:25	
140-21302-12	Z-1182 VEN CB INLET R3 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	12/09/20 00:00	12/10/20 06:25	

Request for Analysis/Chain-of-Custody – RFA/COC #004
The Chemours Company – Fayetteville NC Facility
PFAS Testing on VEN Carbon Bed Inlet



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

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

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 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 Reports and in data packages. Include "Field S: TALS Reports.



140-21302 Chain of Custody

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nts:

Analytical Parameter:	Holding Time Requirements:
HFPO-DA (CAS No. 13252-13-6)	14 Days to Extraction; 40 Days to Anal

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Z-1162 VEN CB Inlet R1 M0010 Filter	1	12/1/20		125 mL HDPE Wide-Mouth Bottle	Particulate Filter (82.6 mm Whatman Glass Microfiber) Method 0010 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. Knoxville: Analyze for HFPO-DA.
Z-1163 VEN CB Inlet R1 M0010 FH of Filter Holder & Probe MeOH Rinse	1	12/1/20		125 mL HDPE Wide-Mouth Bottle	Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the Particulate Filter extraction.
Z-1164 VEN CB Inlet R1 M0010 XAD-2 Resin Tube	1	12/1/20		XAD-2 Resin Tube	XAD-2 Resin Tube Method 0010 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. Knoxville: Analyze for HFPO-DA.

Request for Analysis/Chain-of-Custody – RFA/COC #004
The Chemours Company – Fayetteville NC Facility
PFAS Testing on VEN Carbon Bed Inlet



Environment Testing
 TestAmerica

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Z-1165 VEN CB Inlet R1 M0010 BH of Filter Holder & Coil Condenser MeOH Rinse	1	12/9/20		125 mL HDPE Wide-Mouth Bottle	Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction. Knoxville: Analyze for HFPO-DA.
Z-1166 VEN CB Inlet R1 M0010 Impingers 1,2 & 3 Condensate	1	12/9/20		500 mL HDPE Wide-Mouth Bottle	Impinger #1, #2 & #3 Condensate Method 0010 Train HFPO-DA Analysis	Knoxville: Measure the volume of the Impinger Composite and forward a 250 mL portion to Knoxville for analysis. Knoxville: Analyze for HFPO-DA.
Z-1167 VEN CB Inlet R1 M0010 Impinger Glassware MeOH Rinse	1	12/9/20		250 mL HDPE Wide-Mouth Bottle	Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the XAD-2 Resin Extraction.
Z-1168 VEN CB Inlet R1 M0010 Breakthrough XAD-2 Resin Tube	1	12/9/20		XAD-2 Resin Tube	Breakthrough XAD-2 Resin Tube Method 0010 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. Knoxville: Analyze for HFPO-DA.
Z-1169 VEN CB Inlet R2 M0010 Filter	2	12/9/20		125 mL HDPE Wide-Mouth Bottle	Particulate Filter (82.6 mm Whatman Glass Microfiber) Method 0010 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. Knoxville: Analyze for HFPO-DA.
Z-1170 VEN CB Inlet R2 M0010 FH of Filter Holder & Probe MeOH Rinse	2	12/9/20		125 mL HDPE Wide-Mouth Bottle	Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the Particulate Filter extraction.

Request for Analysis/Chain-of-Custody – RFA/COC #004
The Chemours Company – Fayetteville NC Facility
PFAS Testing on VEN Carbon Bed Inlet



Environment Testing
 TestAmerica

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Z-1171 VEN CB Inlet R2 M0010 XAD-2 Resin Tube	2	12/9/20		XAD-2 Resin Tube	XAD-2 Resin Tube Method 0010 Train HFPO-DA Analysis	<u>Knoxville:</u> 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. <u>Knoxville:</u> Analyze for HFPO-DA.
Z-1172 VEN CB Inlet R2 M0010 BH of Filter Holder & Coil Condenser MeOH Rinse	2	12/9/20		125 mL HDPE Wide-Mouth Bottle	Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	<u>Knoxville:</u> Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction. <u>Knoxville:</u> Analyze for HFPO-DA.
Z-1173 VEN CB Inlet R2 M0010 Impingers 1,2 & 3 Condensate	2	12/9/20		500 mL HDPE Wide-Mouth Bottle	Impinger #1, #2 & #3 Condensate Method 0010 Train HFPO-DA Analysis	<u>Knoxville:</u> Measure the volume of the Impinger Composite and forward a 250 mL portion to Knoxville for analysis. <u>Knoxville:</u> Analyze for HFPO-DA.
Z-1174 VEN CB Inlet R2 M0010 Impinger Glassware MeOH Rinse	2	12/9/20		250 mL HDPE Wide-Mouth Bottle	Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	<u>Knoxville:</u> Use this solvent sample in the XAD-2 Resin Extraction.
Z-1175 VEN CB Inlet R2 M0010 Breakthrough XAD-2 Resin Tube	2	12/9/20		XAD-2 Resin Tube	Breakthrough XAD-2 Resin Tube Method 0010 Train HFPO-DA Analysis	<u>Knoxville:</u> Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level and perform the regular XAD-2 Resin Extraction. <u>Knoxville:</u> Analyze for HFPO-DA.
Z-1176 VEN CB Inlet R3 M0010 Filter	3	12/9/20		125 mL HDPE Wide-Mouth Bottle	Particulate Filter (82.6 mm Whatman Glass Microfiber) Method 0010 Train HFPO-DA Analysis	<u>Knoxville:</u> 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. <u>Knoxville:</u> Analyze for HFPO-DA.

Request for Analysis/Chain-of-Custody – RFA/COC #004
The Chemours Company – Fayetteville NC Facility
PFAS Testing on VEN Carbon Bed Inlet



Environment Testing
 TestAmerica

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Z-1177 VEN CB Inlet R3 M0010 FH of Filter Holder & Probe MeOH Rinse	3	12/9/20		125 mL HDPE Wide-Mouth Bottle	Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the Particulate Filter extraction.
Z-1178 VEN CB Inlet R3 M0010 XAD-2 Resin Tube	3	12/9/20		XAD-2 Resin Tube	XAD-2 Resin Tube Method 0010 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. Knoxville: Analyze for HFPO-DA.
Z-1179 VEN CB Inlet R3 M0010 BH of Filter Holder & Coil Condenser MeOH Rinse	3	12/9/20		125 mL HDPE Wide-Mouth Bottle	Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction. Knoxville: Analyze for HFPO-DA.
Z-1180 VEN CB Inlet R3 M0010 Impingers 1,2 & 3 Condensate	3	12/9/20		500 mL HDPE Wide-Mouth Bottle	Impinger #1, #2 & #3 Condensate Method 0010 Train HFPO-DA Analysis	Knoxville: Measure the volume of the Impinger Composite and forward a 250 mL portion to Knoxville for analysis. Knoxville: Analyze for HFPO-DA.
Z-1181 VEN CB Inlet R3 M0010 Impinger Glassware MeOH Rinse	3	12/9/20		250 mL HDPE Wide-Mouth Bottle	Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the XAD-2 Resin Extraction.
Z-1182 VEN CB Inlet R3 M0010 Breakthrough XAD-2 Resin Tube	3	12/9/20		XAD-2 Resin Tube	Breakthrough XAD-2 Resin Tube Method 0010 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. Knoxville: Analyze for HFPO-DA.

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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 0.7 / CT 0.8 ✓
- (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:

Relinquished By:	<u>Patricia Brady</u> Name	<u>Remko</u> Company	<u>12/9/20 2030</u> Date/Time
Accepted By:	<u>Dorey Gill</u> Name	<u>ETA KNOX</u> Company	<u>12/9/20 2030</u> Date/Time
Relinquished By:	<u>Dorey Gill</u> Name	<u>ETA KNOX</u> Company	<u>12/10/20 0625</u> Date/Time
Accepted By:	<u>[Signature]</u> Name	<u>ETA KNOX</u> Company	<u>12-10-20 06:25</u> Date/Time
Relinquished By:	Name	Company	Date/Time
Accepted By:	Name	Company	Date/Time
Relinquished By:	Name	Company	Date/Time
Accepted By:	Name	Company	Date/Time

EUROFINS/TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Are the shipping containers intact?	/			<input type="checkbox"/> Containers, Broken	
2. Were ambient air containers received intact?			/	<input type="checkbox"/> Checked in lab	
3. The coolers/containers custody seal if present, is it intact?			/	<input type="checkbox"/> Yes <input type="checkbox"/> NA	
4. Is the cooler temperature within limits? (> freezing temp. of water to 6°C, VOST: 10°C) Thermometer ID : <u>5668</u> Correction factor: <u>-0.1 C</u>	/			<input type="checkbox"/> Cooler Out of Temp, Client Contacted, Proceed/Cancel <input type="checkbox"/> Cooler Out of Temp, Same Day Receipt	
5. Were all of the sample containers received intact?	/			<input type="checkbox"/> Containers, Broken	
6. Were samples received in appropriate containers?	/			<input type="checkbox"/> Containers, Improper; Client Contacted; Proceed/Cancel	
7. Do sample container labels match COC? (IDs, Dates, Times)	/			<input type="checkbox"/> COC & Samples Do Not Match <input type="checkbox"/> COC Incorrect/Incomplete <input type="checkbox"/> COC Not Received	
8. Were all of the samples listed on the COC received?	/			<input type="checkbox"/> Sample Received, Not on COC <input type="checkbox"/> Sample on COC, Not Received	
9. Is the date/time of sample collection noted?	/			<input type="checkbox"/> COC; No Date/Time; Client Contacted	Labeling Verified by: _____ Date: _____
10. Was the sampler identified on the COC?	/			<input type="checkbox"/> Sampler Not Listed on COC	
11. Is the client and project name/# identified?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
12. Are tests/parameters listed for each sample?	/			<input type="checkbox"/> COC No tests on COC	pH test strip lot number: _____
13. Is the matrix of the samples noted?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
14. Was COC relinquished? (Signed/Dated/Timed)	/			<input type="checkbox"/> COC Incorrect/Incomplete	Box 16A: pH Preservation Box 18A: Residual Chlorine
15. Were samples received within holding time?	/			<input type="checkbox"/> Holding Time - Receipt	Preservative: _____
16. Were samples received with correct chemical preservative (excluding Encore)?			/	<input type="checkbox"/> pH Adjusted, pH Included (See box 16A) <input type="checkbox"/> Incorrect Preservative	Lot Number: _____ Exp Date: _____ Analyst: _____ Date: _____ Time: _____
17. Were VOA samples received without headspace?			/	<input type="checkbox"/> Headspace (VOA only) <input type="checkbox"/> Residual Chlorine	
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number: _____			/		
19. For 1613B water samples is pH<9?			/	<input type="checkbox"/> If no, notify lab to adjust	
20. For rad samples was sample activity info. Provided?			/	<input type="checkbox"/> Project missing info	
Project #: _____ PM Instructions: _____					



VEN Carbon Bed Outlet Laboratory Data

ANALYTICAL REPORT

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

Laboratory Job ID: 140-21301-1
Client Project/Site: VEN CB Outlet - M0010

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:
1/6/2021 8:06:23 AM

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

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



Table of Contents

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Client Sample Results	6
Default Detection Limits	9
Isotope Dilution Summary	10
QC Sample Results	11
QC Association Summary	13
Lab Chronicle	15
Certification Summary	20
Method Summary	21
Sample Summary	22
Chain of Custody	23

Definitions/Glossary

Client: The Chemours Company FC, LLC
Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

Qualifiers

LCMS

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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

Case Narrative

Client: The Chemours Company FC, LLC
Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

Job ID: 140-21301-1

Laboratory: Eurofins TestAmerica, Knoxville

Narrative

Job Narrative 140-21301-1

Sample Receipt

The samples were received on December 10, 2020 at 6:25 AM in good condition and properly preserved and on ice. The temperature of the cooler at receipt was 1.2° 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:

$$\text{Result, ng/sample} = (\text{on-column concentration, ng/mL}) \times (\text{nominal final volume of extract (10 mL)} / 1 \text{ sample}) \times \text{DF} \times \text{SF}$$

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 following samples were reported with elevated reporting limits for all analytes: E-1962,1963 VEN CB OUTLET R1 M0010 FH (140-21301-1), E-1969,1970 VEN CB OUTLET R2 M0010 FH (140-21301-5) and E-1976,1977 VEN CB OUTLET R3 M0010 FH (140-21301-9). The sample was analyzed at a dilution based on screening results.

Method 537 (modified): Results for samples E-1962,1963 VEN CB OUTLET R1 M0010 FH (140-21301-1) and E-1969,1970 VEN CB OUTLET R2 M0010 FH (140-21301-5) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits

Method 537 (modified): The required dilution factor for the following samples were higher than could be achieved by "in vial" dilution, as it would dilute out the Isotope Dilution Analytes (IDA): E-1976,1977 VEN CB OUTLET R3 M0010 FH (140-21301-9). As such, the dilution was achieved by taking a subsample of the undiluted extract, adding sufficient solvent, and re-spiking the extract with IDA.

Method 537 (modified): The method blank for preparation batch 140-45356 and 140-45592 contained 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

Case Narrative

Client: The Chemours Company FC, LLC
Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

Job ID: 140-21301-1 (Continued)

Laboratory: Eurofins TestAmerica, Knoxville (Continued)

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

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Client Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

Client Sample ID: E-1962,1963 VEN CB OUTLET R1 M0010 FH

Lab Sample ID: 140-21301-1

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1.85	B	0.0490	0.0284	ug/Sample		12/16/20 12:02	01/04/21 14:37	50
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
¹³ C3 HFPO-DA	108		25 - 150				12/16/20 12:02	01/04/21 14:37	50

Client Sample ID: E-1964,1965,1967 VEN CB OUTLET R1 M0010 BH

Lab Sample ID: 140-21301-2

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0687		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 12:47	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
¹³ C3 HFPO-DA	76		25 - 150				12/15/20 14:18	12/24/20 12:47	1

Client Sample ID: E-1966 VEN CB OUTLET R1 M0010 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-21301-3

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0908		0.0585	0.00965	ug/Sample		12/22/20 10:02	12/22/20 21:24	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
¹³ C3 HFPO-DA	110		25 - 150				12/22/20 10:02	12/22/20 21:24	1

Client Sample ID: E-1968 VEN CB OUTLET R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-21301-4

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.00261		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 09:28	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
¹³ C3 HFPO-DA	81		25 - 150				12/15/20 14:18	12/24/20 09:28	1

Client Sample ID: E-1969,1970 VEN CB OUTLET R2 M0010 FH

Lab Sample ID: 140-21301-5

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1.54	B	0.0492	0.0285	ug/Sample		12/16/20 12:02	01/04/21 14:46	50

Eurofins TestAmerica, Knoxville

Client Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

Client Sample ID: E-1969,1970 VEN CB OUTLET R2 M0010 FH

Lab Sample ID: 140-21301-5

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	102		25 - 150	12/16/20 12:02	01/04/21 14:46	50

Client Sample ID: E-1971,1972,1974 VEN CB OUTLET R2 M0010 BH

Lab Sample ID: 140-21301-6

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0990		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 12:57	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	83		25 - 150	12/15/20 14:18	12/24/20 12:57	1

Client Sample ID: E-1973 VEN CB OUTLET R2 M0010 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-21301-7

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0151	J	0.0475	0.00783	ug/Sample		12/22/20 10:02	12/22/20 21:32	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	110		25 - 150	12/22/20 10:02	12/22/20 21:32	1

Client Sample ID: E-1975 VEN CB OUTLET R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-21301-8

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.00185		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 09:46	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	85		25 - 150	12/15/20 14:18	12/24/20 09:46	1

Client Sample ID: E-1976,1977 VEN CB OUTLET R3 M0010 FH

Lab Sample ID: 140-21301-9

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	9.25	B	0.197	0.114	ug/Sample		12/16/20 12:02	01/04/21 14:55	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	94		25 - 150	12/16/20 12:02	01/04/21 14:55	1

Eurofins TestAmerica, Knoxville

Client Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

**Client Sample ID: E-1978,1979,1981 VEN CB OUTLET R3
 M0010 BH**

Lab Sample ID: 140-21301-10

Date Collected: 12/09/20 00:00
 Date Received: 12/10/20 06:25
 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	0.0451		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 13:06	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	91		25 - 150				12/15/20 14:18	12/24/20 13:06	1

**Client Sample ID: E-1980 VEN CB OUTLET R3 M0010
 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-21301-11

Date Collected: 12/09/20 00:00
 Date Received: 12/10/20 06:25
 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	0.00992	J	0.0495	0.00817	ug/Sample		12/22/20 10:02	12/22/20 21:41	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	113		25 - 150				12/22/20 10:02	12/22/20 21:41	1

**Client Sample ID: E-1982 VEN CB OUTLET R3 M0010
 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-21301-12

Date Collected: 12/09/20 00:00
 Date Received: 12/10/20 06:25
 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	0.0104		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 10:03	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	83		25 - 150				12/15/20 14:18	12/24/20 10:03	1

Default Detection Limits

Client: The Chemours Company FC, LLC
Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

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

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- 14

Isotope Dilution Summary

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

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)	
140-21301-1	E-1962,1963 VEN CB OUTLET	108	
140-21301-2	E-1964,1965,1967 VEN CB OUTLET R1 M0010 BH	76	
140-21301-3	E-1966 VEN CB OUTLET R1 M0010 IMPINGERS 1,2&3 CON	110	
140-21301-4	E-1968 VEN CB OUTLET R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	81	
140-21301-5	E-1969,1970 VEN CB OUTLET R2 M0010 FH	102	
140-21301-6	E-1971,1972,1974 VEN CB OUTLET R2 M0010 BH	83	
140-21301-7	E-1973 VEN CB OUTLET R2 M0010 IMPINGERS 1,2&3 CON	110	
140-21301-8	E-1975 VEN CB OUTLET R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	85	
140-21301-9	E-1976,1977 VEN CB OUTLET R3 M0010 FH	94	
140-21301-10	E-1978,1979,1981 VEN CB OUTLET R3 M0010 BH	91	
140-21301-11	E-1980 VEN CB OUTLET R3 M0010 IMPINGERS 1,2&3 CON	113	
140-21301-12	E-1982 VEN CB OUTLET R3 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	83	
LCS 140-45299/2-B	Lab Control Sample	77	
LCS 140-45356/2-B	Lab Control Sample	80	
LCS 140-45516/2-B	Lab Control Sample	106	
LCSD 140-45299/3-B	Lab Control Sample Dup	64	
LCSD 140-45356/3-B	Lab Control Sample Dup	77	
LCSD 140-45516/3-B	Lab Control Sample Dup	109	
MB 140-45299/1-B	Method Blank	83	
MB 140-45356/1-B	Method Blank	86	
MB 140-45516/1-B	Method Blank	104	

Surrogate Legend

HFPODA = 13C3 HFPO-DA

QC Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 140-45299/1-B
Matrix: Air
Analysis Batch: 45601

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 45299

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 08:53	1
Isotope Dilution	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	83		25 - 150				12/15/20 14:18	12/24/20 08:53	1

Lab Sample ID: LCS 140-45299/2-B
Matrix: Air
Analysis Batch: 45601

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 45299

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HFPO-DA	0.0200	0.02114		ug/Sample		106	60 - 140
Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits				
13C3 HFPO-DA	77		25 - 150				

Lab Sample ID: LCSD 140-45299/3-B
Matrix: Air
Analysis Batch: 45601

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 45299

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA	0.0200	0.02185		ug/Sample		109	60 - 140	3	30
Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits						
13C3 HFPO-DA	64		25 - 150						

Lab Sample ID: MB 140-45356/1-B
Matrix: Air
Analysis Batch: 45773

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 45356

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.001713		0.00100	0.000580	ug/Sample		12/16/20 12:02	01/04/21 14:10	1
Isotope Dilution	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	86		25 - 150				12/16/20 12:02	01/04/21 14:10	1

Lab Sample ID: LCS 140-45356/2-B
Matrix: Air
Analysis Batch: 45773

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 45356

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HFPO-DA	0.0200	0.02307		ug/Sample		115	60 - 140
Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits				
13C3 HFPO-DA	80		25 - 150				

QC Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

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

Lab Sample ID: LCSD 140-45356/3-B
Matrix: Air
Analysis Batch: 45773

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 45356

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA	0.0200	0.02465		ug/Sample		123	60 - 140	7	30
		LCSD	LCSD						
Isotope Dilution	%Recovery	Qualifier	Limits						
13C3 HFPO-DA	77		25 - 150						

Lab Sample ID: MB 140-45516/1-B
Matrix: Air
Analysis Batch: 45544

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 45516

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.000500	0.0000825	ug/Sample		12/22/20 10:02	12/22/20 20:57	1
		MB	MB						
Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac			
13C3 HFPO-DA	104		25 - 150	12/22/20 10:02	12/22/20 20:57	1			

Lab Sample ID: LCS 140-45516/2-B
Matrix: Air
Analysis Batch: 45544

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 45516

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA	0.0100	0.01110		ug/Sample		111	60 - 140		
		LCS	LCS						
Isotope Dilution	%Recovery	Qualifier	Limits						
13C3 HFPO-DA	106		25 - 150						

Lab Sample ID: LCSD 140-45516/3-B
Matrix: Air
Analysis Batch: 45544

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 45516

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA	0.0100	0.01129		ug/Sample		113	60 - 140	2	30
		LCSD	LCSD						
Isotope Dilution	%Recovery	Qualifier	Limits						
13C3 HFPO-DA	109		25 - 150						

QC Association Summary

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

LCMS

Prep Batch: 45299

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21301-2	E-1964,1965,1967 VEN CB OUTLET R1 M0010 I	Total/NA	Air	None	
140-21301-4	E-1968 VEN CB OUTLET R1 M0010 BREAKTHF	Total/NA	Air	None	
140-21301-6	E-1971,1972,1974 VEN CB OUTLET R2 M0010 I	Total/NA	Air	None	
140-21301-8	E-1975 VEN CB OUTLET R2 M0010 BREAKTHI	Total/NA	Air	None	
140-21301-10	E-1978,1979,1981 VEN CB OUTLET R3 M0010 I	Total/NA	Air	None	
140-21301-12	E-1982 VEN CB OUTLET R3 M0010 BREAKTHI	Total/NA	Air	None	
MB 140-45299/1-B	Method Blank	Total/NA	Air	None	
LCS 140-45299/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-45299/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Prep Batch: 45356

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21301-1	E-1962,1963 VEN CB OUTLET R1 M0010 FH	Total/NA	Air	None	
140-21301-5	E-1969,1970 VEN CB OUTLET R2 M0010 FH	Total/NA	Air	None	
140-21301-9	E-1976,1977 VEN CB OUTLET R3 M0010 FH	Total/NA	Air	None	
MB 140-45356/1-B	Method Blank	Total/NA	Air	None	
LCS 140-45356/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-45356/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Cleanup Batch: 45468

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21301-2	E-1964,1965,1967 VEN CB OUTLET R1 M0010 I	Total/NA	Air	Split	45299
140-21301-4	E-1968 VEN CB OUTLET R1 M0010 BREAKTHF	Total/NA	Air	Split	45299
140-21301-6	E-1971,1972,1974 VEN CB OUTLET R2 M0010 I	Total/NA	Air	Split	45299
140-21301-8	E-1975 VEN CB OUTLET R2 M0010 BREAKTHI	Total/NA	Air	Split	45299
140-21301-10	E-1978,1979,1981 VEN CB OUTLET R3 M0010 I	Total/NA	Air	Split	45299
140-21301-12	E-1982 VEN CB OUTLET R3 M0010 BREAKTHI	Total/NA	Air	Split	45299
MB 140-45299/1-B	Method Blank	Total/NA	Air	Split	45299
LCS 140-45299/2-B	Lab Control Sample	Total/NA	Air	Split	45299
LCSD 140-45299/3-B	Lab Control Sample Dup	Total/NA	Air	Split	45299

Prep Batch: 45516

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21301-3	E-1966 VEN CB OUTLET R1 M0010 IMPINGER:	Total/NA	Air	None	
140-21301-7	E-1973 VEN CB OUTLET R2 M0010 IMPINGER:	Total/NA	Air	None	
140-21301-11	E-1980 VEN CB OUTLET R3 M0010 IMPINGER:	Total/NA	Air	None	
MB 140-45516/1-B	Method Blank	Total/NA	Air	None	
LCS 140-45516/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-45516/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Cleanup Batch: 45531

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21301-3	E-1966 VEN CB OUTLET R1 M0010 IMPINGER:	Total/NA	Air	Split	45516
140-21301-7	E-1973 VEN CB OUTLET R2 M0010 IMPINGER:	Total/NA	Air	Split	45516
140-21301-11	E-1980 VEN CB OUTLET R3 M0010 IMPINGER:	Total/NA	Air	Split	45516
MB 140-45516/1-B	Method Blank	Total/NA	Air	Split	45516
LCS 140-45516/2-B	Lab Control Sample	Total/NA	Air	Split	45516
LCSD 140-45516/3-B	Lab Control Sample Dup	Total/NA	Air	Split	45516

QC Association Summary

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

LCMS

Analysis Batch: 45544

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21301-3	E-1966 VEN CB OUTLET R1 M0010 IMPINGER:	Total/NA	Air	537 (modified)	45531
140-21301-7	E-1973 VEN CB OUTLET R2 M0010 IMPINGER:	Total/NA	Air	537 (modified)	45531
140-21301-11	E-1980 VEN CB OUTLET R3 M0010 IMPINGER:	Total/NA	Air	537 (modified)	45531
MB 140-45516/1-B	Method Blank	Total/NA	Air	537 (modified)	45531
LCS 140-45516/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	45531
LCSD 140-45516/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	45531

Cleanup Batch: 45592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21301-1	E-1962,1963 VEN CB OUTLET R1 M0010 FH	Total/NA	Air	Split	45356
140-21301-5	E-1969,1970 VEN CB OUTLET R2 M0010 FH	Total/NA	Air	Split	45356
140-21301-9	E-1976,1977 VEN CB OUTLET R3 M0010 FH	Total/NA	Air	Split	45356
MB 140-45356/1-B	Method Blank	Total/NA	Air	Split	45356
LCS 140-45356/2-B	Lab Control Sample	Total/NA	Air	Split	45356
LCSD 140-45356/3-B	Lab Control Sample Dup	Total/NA	Air	Split	45356

Analysis Batch: 45601

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21301-2	E-1964,1965,1967 VEN CB OUTLET R1 M0010 I	Total/NA	Air	537 (modified)	45468
140-21301-4	E-1968 VEN CB OUTLET R1 M0010 BREAKTHF	Total/NA	Air	537 (modified)	45468
140-21301-6	E-1971,1972,1974 VEN CB OUTLET R2 M0010 I	Total/NA	Air	537 (modified)	45468
140-21301-8	E-1975 VEN CB OUTLET R2 M0010 BREAKTHI	Total/NA	Air	537 (modified)	45468
140-21301-10	E-1978,1979,1981 VEN CB OUTLET R3 M0010 I	Total/NA	Air	537 (modified)	45468
140-21301-12	E-1982 VEN CB OUTLET R3 M0010 BREAKTHI	Total/NA	Air	537 (modified)	45468
MB 140-45299/1-B	Method Blank	Total/NA	Air	537 (modified)	45468
LCS 140-45299/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	45468
LCSD 140-45299/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	45468

Cleanup Batch: 45772

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21301-9	E-1976,1977 VEN CB OUTLET R3 M0010 FH	Total/NA	Air	Dilution	45592

Analysis Batch: 45773

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21301-1	E-1962,1963 VEN CB OUTLET R1 M0010 FH	Total/NA	Air	537 (modified)	45592
140-21301-5	E-1969,1970 VEN CB OUTLET R2 M0010 FH	Total/NA	Air	537 (modified)	45592
140-21301-9	E-1976,1977 VEN CB OUTLET R3 M0010 FH	Total/NA	Air	537 (modified)	45772
MB 140-45356/1-B	Method Blank	Total/NA	Air	537 (modified)	45592
LCS 140-45356/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	45592
LCSD 140-45356/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	45592

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

Client Sample ID: E-1962,1963 VEN CB OUTLET R1 M0010 FH

Lab Sample ID: 140-21301-1

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	51 mL	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			26 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		50			45773	01/04/21 14:37	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: E-1964,1965,1967 VEN CB OUTLET R1 M0010 BH

Lab Sample ID: 140-21301-2

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 12:47	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: E-1966 VEN CB OUTLET R1 M0010 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-21301-3

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.00855 Sample	10 mL	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 21:24	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: E-1968 VEN CB OUTLET R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-21301-4

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 09:28	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

Client Sample ID: E-1969,1970 VEN CB OUTLET R2 M0010 FH

Lab Sample ID: 140-21301-5

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	59 mL	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			30 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		50			45773	01/04/21 14:46	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: E-1971,1972,1974 VEN CB OUTLET R2 M0010 BH

Lab Sample ID: 140-21301-6

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 12:57	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: E-1973 VEN CB OUTLET R2 M0010 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-21301-7

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.01053 Sample	10 mL	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 21:32	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: E-1975 VEN CB OUTLET R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-21301-8

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 09:46	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

Client Sample ID: E-1976,1977 VEN CB OUTLET R3 M0010 FH

Lab Sample ID: 140-21301-9

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	61 mL	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			31 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Cleanup	Dilution			50 uL	10000 uL	45772	01/04/21 12:43	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			45773	01/04/21 14:55	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: E-1978,1979,1981 VEN CB OUTLET R3 M0010 BH

Lab Sample ID: 140-21301-10

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 13:06	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: E-1980 VEN CB OUTLET R3 M0010 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-21301-11

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.0101 Sample	10 mL	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 21:41	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: E-1982 VEN CB OUTLET R3 M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-21301-12

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 10:03	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

Client Sample ID: Method Blank

Lab Sample ID: MB 140-45299/1-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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 08:53	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-45356/1-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	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45773	01/04/21 14:10	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-45516/1-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	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 20:57	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-45299/2-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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 09:02	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-45356/2-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	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45773	01/04/21 14:19	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-45516/2-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	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 21:06	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-45299/3-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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 09:11	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-45356/3-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	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45773	01/04/21 14:28	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-45516/3-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	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 21:15	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
 Project/Site: VEN CB Outlet - M0010

Job ID: 140-21301-1

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	06-30-21
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	01-01-21 *
Louisiana	NELAP	83979	06-30-21
Louisiana (DW)	State	LA019	12-31-21
Maryland	State	277	03-31-21
Michigan	State	9933	12-11-22
Nevada	State	TN00009	07-31-21
New Hampshire	NELAP	299919	01-17-21
New Jersey	NELAP	TN001	07-01-21
New York	NELAP	10781	03-31-21
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	01-19-21
West Virginia (DW)	State	9955C	01-01-21 *
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 CB Outlet - M0010

Job ID: 140-21301-1

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 CB Outlet - M0010

Job ID: 140-21301-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-21301-1	E-1962,1963 VEN CB OUTLET R1 M0010 FH	Air	12/09/20 00:00	12/10/20 06:25	
140-21301-2	E-1964,1965,1967 VEN CB OUTLET R1 M0010 BH	Air	12/09/20 00:00	12/10/20 06:25	
140-21301-3	E-1966 VEN CB OUTLET R1 M0010 IMPINGER: 1,2&3 COND	Air	12/09/20 00:00	12/10/20 06:25	
140-21301-4	E-1968 VEN CB OUTLET R1 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	12/09/20 00:00	12/10/20 06:25	
140-21301-5	E-1969,1970 VEN CB OUTLET R2 M0010 FH	Air	12/09/20 00:00	12/10/20 06:25	
140-21301-6	E-1971,1972,1974 VEN CB OUTLET R2 M0010 BH	Air	12/09/20 00:00	12/10/20 06:25	
140-21301-7	E-1973 VEN CB OUTLET R2 M0010 IMPINGER: 1,2&3 COND	Air	12/09/20 00:00	12/10/20 06:25	
140-21301-8	E-1975 VEN CB OUTLET R2 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	12/09/20 00:00	12/10/20 06:25	
140-21301-9	E-1976,1977 VEN CB OUTLET R3 M0010 FH	Air	12/09/20 00:00	12/10/20 06:25	
140-21301-10	E-1978,1979,1981 VEN CB OUTLET R3 M0010 BH	Air	12/09/20 00:00	12/10/20 06:25	
140-21301-11	E-1980 VEN CB OUTLET R3 M0010 IMPINGER: 1,2&3 COND	Air	12/09/20 00:00	12/10/20 06:25	
140-21301-12	E-1982 VEN CB OUTLET R3 M0010 BREAKTHROUGH XAD-2 RESIN TUBE	Air	12/09/20 00:00	12/10/20 06:25	

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Request for Analysis/Chain-of-Custody – RFA/COC #005
The Chemours Company – Fayetteville NC Facility
PFAS Testing on VEN Carbon Bed Outlet



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

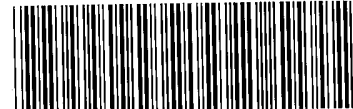
Laboratory Deliverable Turnaround Requirements:	
Analytical Due Date: (Review-Released Data)	21 Days from Lab Receipt
Data Package Due Date:	28 Days from Lab Receipt

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 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 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	



140-21301 Chain of Custody

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
E-1962 VEN CB Outlet R1 M0010 Filter	1	12/9/20		125 mL HDPE Wide-Mouth Bottle	Particulate Filter (82.6 mm Whatman Glass Microfiber) Method 0010 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. Knoxville: Analyze for HFPO-DA.
E-1963 VEN CB Outlet R1 M0010 FH of Filter Holder & Probe MeOH Rinse	1	12/9/20		125 mL HDPE Wide-Mouth Bottle	Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the Particulate Filter extraction.
E-1964 VEN CB Outlet R1 M0010 XAD-2 Resin Tube	1	12/9/20		XAD-2 Resin Tube	XAD-2 Resin Tube Method 0010 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. Knoxville: Analyze for HFPO-DA.

Request for Analysis/Chain-of-Custody – RFA/COC #005
The Chemours Company – Fayetteville NC Facility
PFAS Testing on VEN Carbon Bed Outlet



Environment Testing
 TestAmerica

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
E-1965 VEN CB Outlet R1 M0010 BH of Filter Holder & Coil Condenser MeOH Rinse	1	12/9/20		125 mL HDPE Wide-Mouth Bottle	Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction. Knoxville: Analyze for HFPO-DA.
E-1966 VEN CB Outlet R1 M0010 Impingers 1,2 & 3 Condensate	1	12/9/20		500 mL HDPE Wide-Mouth Bottle	Impinger #1, #2 & #3 Condensate Method 0010 Train HFPO-DA Analysis	Knoxville: Measure the volume of the Impinger Composite and forward a 250 mL portion to Knoxville for analysis. Knoxville: Analyze for HFPO-DA.
E-1967 VEN CB Outlet R1 M0010 Impinger Glassware MeOH Rinse	1	12/9/20		250 mL HDPE Wide-Mouth Bottle	Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the XAD-2 Resin Extraction.
E-1968 VEN CB Outlet R1 M0010 Breakthrough XAD-2 Resin Tube	1	12/9/20		XAD-2 Resin Tube	Breakthrough XAD-2 Resin Tube Method 0010 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. Knoxville: Analyze for HFPO-DA.
E-1969 VEN CB Outlet R2 M0010 Filter	2	12/9/20		125 mL HDPE Wide-Mouth Bottle	Particulate Filter (82.6 mm Whatman Glass Microfiber) Method 0010 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. Knoxville: Analyze for HFPO-DA.
E-1970 VEN CB Outlet R2 M0010 FH of Filter Holder & Probe MeOH Rinse	2	12/9/20		125 mL HDPE Wide-Mouth Bottle	Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the Particulate Filter extraction.

Request for Analysis/Chain-of-Custody – RFA/COC #005
The Chemours Company – Fayetteville NC Facility
PFAS Testing on VEN Carbon Bed Outlet



Environment Testing
 TestAmerica

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
E-1971 VEN CB Outlet R2 M0010 XAD-2 Resin Tube	2	12/9/20		XAD-2 Resin Tube	XAD-2 Resin Tube Method 0010 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. Knoxville: Analyze for HFPO-DA.
E-1972 VEN CB Outlet R2 M0010 BH of Filter Holder & Coil Condenser MeOH Rinse	2	12/9/20		125 mL HDPE Wide-Mouth Bottle	Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction. Knoxville: Analyze for HFPO-DA.
E-1973 VEN CB Outlet R2 M0010 Impingers 1,2 & 3 Condensate	2	12/9/20		500 mL HDPE Wide-Mouth Bottle	Impinger #1, #2 & #3 Condensate Method 0010 Train HFPO-DA Analysis	Knoxville: Measure the volume of the Impinger Composite and forward a 250 mL portion to Knoxville for analysis. Knoxville: Analyze for HFPO-DA.
E-1974 VEN CB Outlet R2 M0010 Impinger Glassware MeOH Rinse	2	12/9/20		250 mL HDPE Wide-Mouth Bottle	Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the XAD-2 Resin Extraction.
E-1975 VEN CB Outlet R2 M0010 Breakthrough XAD-2 Resin Tube	2	12/9/20		XAD-2 Resin Tube	Breakthrough XAD-2 Resin Tube Method 0010 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. Knoxville: Analyze for HFPO-DA.
E-1976 VEN CB Outlet R3 M0010 Filter	3	12/9/20		125 mL HDPE Wide-Mouth Bottle	Particulate Filter (82.6 mm Whatman Glass Microfiber) Method 0010 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. Knoxville: Analyze for HFPO-DA.

Request for Analysis/Chain-of-Custody – RFA/COC #005
The Chemours Company – Fayetteville NC Facility
PFAS Testing on VEN Carbon Bed Outlet



Environment Testing
 TestAmerica

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
E-1977 VEN CB Outlet R3 M0010 FH of Filter Holder & Probe MeOH Rinse	3	12/9/20		125 mL HDPE Wide-Mouth Bottle	Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the Particulate Filter extraction.
E-1978 VEN CB Outlet R3 M0010 XAD-2 Resin Tube	3	12/9/20		XAD-2 Resin Tube	XAD-2 Resin Tube Method 0010 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. Knoxville: Analyze for HFPO-DA.
E-1979 VEN CB Outlet R3 M0010 BH of Filter Holder & Coil Condenser MeOH Rinse	3	12/9/20		125 mL HDPE Wide-Mouth Bottle	Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction. Knoxville: Analyze for HFPO-DA.
E-1980 VEN CB Outlet R3 M0010 Impingers 1, 2 & 3 Condensate	3	12/9/20		500 mL HDPE Wide-Mouth Bottle	Impinger #1, #2 & #3 Condensate Method 0010 Train HFPO-DA Analysis	Knoxville: Measure the volume of the Impinger Composite and forward a 250 mL portion to Knoxville for analysis. Knoxville: Analyze for HFPO-DA.
E-1981 VEN CB Outlet R3 M0010 Impinger Glassware MeOH Rinse	3	12/9/20		250 mL HDPE Wide-Mouth Bottle	Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse Method 0010 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the XAD-2 Resin Extraction.
E-1982 VEN CB Outlet R3 M0010 Breakthrough XAD-2 Resin Tube	3	12/9/20		XAD-2 Resin Tube	Breakthrough XAD-2 Resin Tube Method 0010 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. Knoxville: Analyze for HFPO-DA.

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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 1.1 / CT 1.2 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:

Relinquished By:	<u>Patricia Andy</u> Name	<u>Ramboll</u> Company	<u>12/9/20 20:30</u> Date/Time
Accepted By:	<u>Dony Cahill</u> Name	<u>ETA KNOX</u> Company	<u>12/9/20 20:30</u> Date/Time
Relinquished By:	<u>Dony Cahill</u> Name	<u>ETA KNOX</u> Company	<u>12/10/20 06:25</u> Date/Time
Accepted By:	<u>[Signature]</u> Name	<u>ETA KNOX</u> Company	<u>12-10-20 06:25</u> Date/Time
Relinquished By:	_____ Name	_____ Company	_____ Date/Time
Accepted By:	_____ Name	_____ Company	_____ Date/Time
Relinquished By:	_____ Name	_____ Company	_____ Date/Time
Accepted By:	_____ Name	_____ Company	_____ Date/Time

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

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Are the shipping containers intact?	/			<input type="checkbox"/> Containers, Broken	
2. Were ambient air containers received intact?			/	<input type="checkbox"/> Checked in lab	
3. The coolers/containers custody seal if present, is it intact?			/	<input type="checkbox"/> Yes <input type="checkbox"/> NA	
4. Is the cooler temperature within limits? (> freezing temp. of water to 6°C, VOST: 10°C) Thermometer ID : <u>5448</u> Correction factor: <u>+0.1°C</u>	/			<input type="checkbox"/> Cooler Out of Temp, Client Contacted, Proceed/Cancel <input type="checkbox"/> Cooler Out of Temp, Same Day Receipt	
5. Were all of the sample containers received intact?	/			<input type="checkbox"/> Containers, Broken	
6. Were samples received in appropriate containers?	/			<input type="checkbox"/> Containers, Improper; Client Contacted; Proceed/Cancel	
7. Do sample container labels match COC? (IDs, Dates, Times)	/			<input type="checkbox"/> COC & Samples Do Not Match <input type="checkbox"/> COC Incorrect/Incomplete <input type="checkbox"/> COC Not Received	
8. Were all of the samples listed on the COC received?	/			<input type="checkbox"/> Sample Received, Not on COC <input type="checkbox"/> Sample on COC, Not Received	
9. Is the date/time of sample collection noted?	/			<input type="checkbox"/> COC; No Date/Time; Client Contacted	Labeling Verified by: _____ Date: _____
10. Was the sampler identified on the COC?	/			<input type="checkbox"/> Sampler Not Listed on COC	
11. Is the client and project name/# identified?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
12. Are tests/parameters listed for each sample?	/			<input type="checkbox"/> COC No tests on COC	pH test strip lot number: _____
13. Is the matrix of the samples noted?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
14. Was COC relinquished? (Signed/Dated/Timed)	/			<input type="checkbox"/> COC Incorrect/Incomplete	Box 16A: pH Preservation Box 18A: Residual Chlorine
15. Were samples received within holding time?	/			<input type="checkbox"/> Holding Time - Receipt	Preservative: _____
16. Were samples received with correct chemical preservative (excluding Encore)?			/	<input type="checkbox"/> pH Adjusted, pH Included (See box 16A) <input type="checkbox"/> Incorrect Preservative	Lot Number: _____ Exp Date: _____ Analyst: _____
17. Were VOA samples received without headspace?			/	<input type="checkbox"/> Headspace (VOA only) <input type="checkbox"/> Residual Chlorine	Date: _____ Time: _____
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number: _____			/		
19. For 1613B water samples is pH<9?			/	<input type="checkbox"/> If no, notify lab to adjust	
20. For rad samples was sample activity info. Provided?			/	<input type="checkbox"/> Project missing info	
Project #: _____ PM Instructions: _____					

Sample Receiving Associate: Randy Stinson Date: 12-12-20 QA026R32.doc, 062719



QA/QC Laboratory Data

ANALYTICAL REPORT

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

Laboratory Job ID: 140-21303-1
Client Project/Site: Quarter 4 Field QC - M0010

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:
1/6/2021 8:07:00 AM

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

LINKS

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results through
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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



Table of Contents

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Client Sample Results	5
Default Detection Limits	8
Isotope Dilution Summary	9
QC Sample Results	10
QC Association Summary	13
Lab Chronicle	15
Certification Summary	19
Method Summary	20
Sample Summary	21
Chain of Custody	22

Definitions/Glossary

Client: The Chemours Company FC, LLC
Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*5-	Isotope dilution analyte is outside acceptance limits, low biased.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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

Case Narrative

Client: The Chemours Company FC, LLC
Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

Job ID: 140-21303-1

Laboratory: Eurofins TestAmerica, Knoxville

Narrative

Job Narrative 140-21303-1

Comments

No additional comments.

Receipt

The samples were received on 12/10/2020 6:25 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.2° 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:

$$\text{Result, ng/sample} = (\text{on-column concentration, ng/mL}) \times (\text{nominal final volume of extract (10 mL) / 1 sample}) \times \text{DF} \times \text{SF}$$

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 140-45299 and 140-45468 was spilled during sample transfer to concentration thimble. About half of the sample was spilled. The method blank was allowed to continue on through analysis. IDA recovery for 13C6 HFPO-DA was still above QC limits, while 13C4 PFOA was outside QC limits, but with a signal to noise ratio greater than 10:1. This was the second method blank for this batch. The first method blank passed all QC requirements. The samples were consumed during the extraction process, therefore, the data have been reported.

Method 537 (modified): The method blank for preparation batch 140-45356 and 140-45592 contained 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.

Client Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

Client Sample ID: Q-1562,1563 QC VEN CB M0010 FH BT

Lab Sample ID: 140-21303-1

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFOA	0.00903		0.00100	0.000190	ug/Sample		12/16/20 12:02	01/04/21 15:30	1
HFPO-DA	0.0156	B	0.00100	0.000580	ug/Sample		12/16/20 12:02	01/04/21 15:30	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	94		25 - 150				12/16/20 12:02	01/04/21 15:30	1
13C3 HFPO-DA	87		25 - 150				12/16/20 12:02	01/04/21 15:30	1

Client Sample ID: Q-1564,1565,1567 QC VEN CB M0010 BH BT

Lab Sample ID: 140-21303-2

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFOA	0.0120		0.00100	0.000170	ug/Sample		12/15/20 14:18	12/24/20 11:36	1
HFPO-DA	0.0487		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 11:36	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	106		25 - 150				12/15/20 14:18	12/24/20 11:36	1
13C3 HFPO-DA	95		25 - 150				12/15/20 14:18	12/24/20 11:36	1

Client Sample ID: Q-1566 QC VEN CB M0010 IMPINGERS

Lab Sample ID: 140-21303-3

1,2&3 COND BT

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFOA	ND		0.000500	0.0000950	ug/Sample		12/22/20 10:02	12/22/20 22:17	1
HFPO-DA	ND		0.000500	0.0000825	ug/Sample		12/22/20 10:02	12/22/20 22:17	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	101		25 - 150				12/22/20 10:02	12/22/20 22:17	1
13C3 HFPO-DA	101		25 - 150				12/22/20 10:02	12/22/20 22:17	1

Client Sample ID: Q-1568 QC VEN CB M0010

Lab Sample ID: 140-21303-4

BREAKTHROUGH XAD-2 RESIN TUBE BT

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFOA	0.0102		0.00100	0.000170	ug/Sample		12/15/20 14:18	12/24/20 11:46	1
HFPO-DA	0.00475		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 11:46	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	105		25 - 150				12/15/20 14:18	12/24/20 11:46	1
13C3 HFPO-DA	94		25 - 150				12/15/20 14:18	12/24/20 11:46	1

Client Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

Client Sample ID: Q-1569 QC VEN CB M0010 DI WATER RB

Lab Sample ID: 140-21303-5

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFOA	ND		0.000500	0.0000950	ug/Sample		12/22/20 10:02	12/22/20 22:43	1
HFPO-DA	ND		0.000500	0.0000825	ug/Sample		12/22/20 10:02	12/22/20 22:43	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	106		25 - 150				12/22/20 10:02	12/22/20 22:43	1
13C3 HFPO-DA	112		25 - 150				12/22/20 10:02	12/22/20 22:43	1

Client Sample ID: Q-1570 QC VEN CB M0010 MEOH WITH 5% NH4OH RB

Lab Sample ID: 140-21303-6

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFOA	ND		0.00100	0.000170	ug/Sample		12/15/20 14:18	12/24/20 11:54	1
HFPO-DA	ND		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 11:54	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	92		25 - 150				12/15/20 14:18	12/24/20 11:54	1
13C3 HFPO-DA	96		25 - 150				12/15/20 14:18	12/24/20 11:54	1

Client Sample ID: Q-1571 QC VEN CB M0010 COMBINED GLASSWARE RINSES (MEOH/5% NH4OH) PB

Lab Sample ID: 140-21303-7

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFOA	0.000756	J	0.00100	0.000170	ug/Sample		12/15/20 14:18	12/24/20 12:03	1
HFPO-DA	0.0270		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 12:03	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	89		25 - 150				12/15/20 14:18	12/24/20 12:03	1
13C3 HFPO-DA	90		25 - 150				12/15/20 14:18	12/24/20 12:03	1

Client Sample ID: A-7263 MEDIA CHECK XAD

Lab Sample ID: 140-21303-8

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFOA	0.00917		0.00100	0.000170	ug/Sample		12/15/20 14:18	12/24/20 13:32	1
HFPO-DA	0.0325		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 13:32	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	96		25 - 150				12/15/20 14:18	12/24/20 13:32	1
13C3 HFPO-DA	89		25 - 150				12/15/20 14:18	12/24/20 13:32	1

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Client Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

Client Sample ID: A-7264 MEDIA CHECK FILTER

Lab Sample ID: 140-21303-9

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFOA	ND		0.00100	0.000190	ug/Sample		12/16/20 12:02	01/04/21 15:56	1
HFPO-DA	0.00669	B	0.00100	0.000580	ug/Sample		12/16/20 12:02	01/04/21 15:56	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C4 PFOA	88		25 - 150				12/16/20 12:02	01/04/21 15:56	1
13C3 HFPO-DA	85		25 - 150				12/16/20 12:02	01/04/21 15:56	1

Default Detection Limits

Client: The Chemours Company FC, LLC
Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

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
PFOA	0.00100	0.000190	ug/Sample
PFOA	0.00100	0.000170	ug/Sample
PFOA	0.00200	0.000380	ug/Sample

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Isotope Dilution Summary

Client: The Chemours Company FC, LLC
 Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Air

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)	
		PFOA (25-150)	HFPODA (25-150)
140-21303-1	Q-1562,1563 QC VEN CB M001	94	87
140-21303-2	Q-1564,1565,1567 QC VEN CB M0010 BH BT	106	95
140-21303-3	Q-1566 QC VEN CB M0010 IMPINGERS 1,2&3 COND BT	101	101
140-21303-4	Q-1568 QC VEN CB M0010 BREAKTHROUGH XAD-2 RESI TUBE BT	105	94
140-21303-5	Q-1569 QC VEN CB M0010 DI WATER RB	106	112
140-21303-6	Q-1570 QC VEN CB M0010 MEOH WITH 5% NH4OH RB	92	96
140-21303-7	Q-1571 QC VEN CB M0010 COMBINED GLASSWARE RINSES (MEOH/5% NH4OH) PI	89	90
140-21303-8	A-7263 MEDIA CHECK XAD	96	89
140-21303-9	A-7264 MEDIA CHECK FILTER	88	85
LCS 140-45299/2-B	Lab Control Sample	62	77
LCS 140-45356/2-B	Lab Control Sample	83	80
LCS 140-45516/2-B	Lab Control Sample	102	106
LCSD 140-45299/3-B	Lab Control Sample Dup	47	64
LCSD 140-45356/3-B	Lab Control Sample Dup	79	77
LCSD 140-45516/3-B	Lab Control Sample Dup	101	109
MB 140-45299/14-B	Method Blank	17 *5-	30
MB 140-45299/1-B	Method Blank	73	83
MB 140-45356/1-B	Method Blank	86	86
MB 140-45516/1-B	Method Blank	101	104

Surrogate Legend

PFOA = 13C4 PFOA

HFPODA = 13C3 HFPO-DA

QC Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 140-45299/14-B
Matrix: Air
Analysis Batch: 45601

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 45299

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
PFOA	ND		0.00100	0.000170	ug/Sample		12/15/20 14:18	12/24/20 11:06	1
HFPO-DA	ND		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 11:06	1
Isotope Dilution	MB MB		Limits				Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier							
13C4 PFOA	17	*5-	25 - 150				12/15/20 14:18	12/24/20 11:06	1
13C3 HFPO-DA	30		25 - 150				12/15/20 14:18	12/24/20 11:06	1

Lab Sample ID: MB 140-45299/1-B
Matrix: Air
Analysis Batch: 45601

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 45299

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
PFOA	ND		0.00100	0.000170	ug/Sample		12/15/20 14:18	12/24/20 08:53	1
HFPO-DA	ND		0.00160	0.00140	ug/Sample		12/15/20 14:18	12/24/20 08:53	1
Isotope Dilution	MB MB		Limits				Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier							
13C4 PFOA	73		25 - 150				12/15/20 14:18	12/24/20 08:53	1
13C3 HFPO-DA	83		25 - 150				12/15/20 14:18	12/24/20 08:53	1

Lab Sample ID: LCS 140-45299/2-B
Matrix: Air
Analysis Batch: 45601

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 45299

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA	0.0200	0.02114		ug/Sample		106	60 - 140		
Isotope Dilution	LCS LCS		Limits						
	%Recovery	Qualifier							
13C4 PFOA	62		25 - 150						
13C3 HFPO-DA	77		25 - 150						

Lab Sample ID: LCSD 140-45299/3-B
Matrix: Air
Analysis Batch: 45601

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 45299

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA	0.0200	0.02185		ug/Sample		109	60 - 140	3	30
Isotope Dilution	LCSD LCSD		Limits						
	%Recovery	Qualifier							
13C4 PFOA	47		25 - 150						
13C3 HFPO-DA	64		25 - 150						

Lab Sample ID: MB 140-45356/1-B
Matrix: Air
Analysis Batch: 45773

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 45356

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
PFOA	ND		0.00100	0.000190	ug/Sample		12/16/20 12:02	01/04/21 14:10	1

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QC Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

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

Lab Sample ID: MB 140-45356/1-B
Matrix: Air
Analysis Batch: 45773

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 45356

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.001713		0.00100	0.000580	ug/Sample		12/16/20 12:02	01/04/21 14:10	1
MB MB									
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	86		25 - 150				12/16/20 12:02	01/04/21 14:10	1
13C3 HFPO-DA	86		25 - 150				12/16/20 12:02	01/04/21 14:10	1

Lab Sample ID: LCS 140-45356/2-B
Matrix: Air
Analysis Batch: 45773

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 45356

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
PFOA	0.0200	0.02151		ug/Sample		108	60 - 140
HFPO-DA	0.0200	0.02307		ug/Sample		115	60 - 140
LCS LCS							
Isotope Dilution	%Recovery	Qualifier	Limits				
13C4 PFOA	83		25 - 150				
13C3 HFPO-DA	80		25 - 150				

Lab Sample ID: LCSD 140-45356/3-B
Matrix: Air
Analysis Batch: 45773

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 45356

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
PFOA	0.0200	0.02270		ug/Sample		113	60 - 140	5	30
HFPO-DA	0.0200	0.02465		ug/Sample		123	60 - 140	7	30
LCSD LCSD									
Isotope Dilution	%Recovery	Qualifier	Limits						
13C4 PFOA	79		25 - 150						
13C3 HFPO-DA	77		25 - 150						

Lab Sample ID: MB 140-45516/1-B
Matrix: Air
Analysis Batch: 45544

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 45516

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFOA	ND		0.000500	0.0000950	ug/Sample		12/22/20 10:02	12/22/20 20:57	1
HFPO-DA	ND		0.000500	0.0000825	ug/Sample		12/22/20 10:02	12/22/20 20:57	1
MB MB									
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	101		25 - 150				12/22/20 10:02	12/22/20 20:57	1
13C3 HFPO-DA	104		25 - 150				12/22/20 10:02	12/22/20 20:57	1

Lab Sample ID: LCS 140-45516/2-B
Matrix: Air
Analysis Batch: 45544

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 45516

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
PFOA	0.0100	0.01040		ug/Sample		104	60 - 140
HFPO-DA	0.0100	0.01110		ug/Sample		111	60 - 140

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QC Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

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

<i>Isotope Dilution</i>	<i>LCS LCS</i>		<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
13C4 PFOA	102		25 - 150
13C3 HFPO-DA	106		25 - 150

Lab Sample ID: LCSD 140-45516/3-B
Matrix: Air
Analysis Batch: 45544

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 45516

<i>Analyte</i>	<i>Spike Added</i>	<i>LCSD Result</i>	<i>LCSD Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec.</i>		<i>RPD</i>	
							<i>Limits</i>	<i>RPD</i>	<i>Limit</i>	
PFOA	0.0100	0.01088		ug/Sample		109	60 - 140	5	30	
HFPO-DA	0.0100	0.01129		ug/Sample		113	60 - 140	2	30	

<i>Isotope Dilution</i>	<i>LCSD LCSD</i>		<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
13C4 PFOA	101		25 - 150
13C3 HFPO-DA	109		25 - 150

QC Association Summary

Client: The Chemours Company FC, LLC
 Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

LCMS

Prep Batch: 45299

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21303-2	Q-1564,1565,1567 QC VEN CB M0010 BH BT	Total/NA	Air	None	
140-21303-4	Q-1568 QC VEN CB M0010 BREAKTHROUGH	Total/NA	Air	None	
140-21303-6	Q-1570 QC VEN CB M0010 MEOH WITH 5% NF	Total/NA	Air	None	
140-21303-7	Q-1571 QC VEN CB M0010 COMBINED GLASS	Total/NA	Air	None	
140-21303-8	A-7263 MEDIA CHECK XAD	Total/NA	Air	None	
MB 140-45299/14-B	Method Blank	Total/NA	Air	None	
MB 140-45299/1-B	Method Blank	Total/NA	Air	None	
LCS 140-45299/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-45299/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Prep Batch: 45356

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21303-1	Q-1562,1563 QC VEN CB M0010 FH BT	Total/NA	Air	None	
140-21303-9	A-7264 MEDIA CHECK FILTER	Total/NA	Air	None	
MB 140-45356/1-B	Method Blank	Total/NA	Air	None	
LCS 140-45356/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-45356/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Cleanup Batch: 45468

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21303-2	Q-1564,1565,1567 QC VEN CB M0010 BH BT	Total/NA	Air	Split	45299
140-21303-4	Q-1568 QC VEN CB M0010 BREAKTHROUGH	Total/NA	Air	Split	45299
140-21303-6	Q-1570 QC VEN CB M0010 MEOH WITH 5% NF	Total/NA	Air	Split	45299
140-21303-7	Q-1571 QC VEN CB M0010 COMBINED GLASS	Total/NA	Air	Split	45299
140-21303-8	A-7263 MEDIA CHECK XAD	Total/NA	Air	Split	45299
MB 140-45299/14-B	Method Blank	Total/NA	Air	Split	45299
MB 140-45299/1-B	Method Blank	Total/NA	Air	Split	45299
LCS 140-45299/2-B	Lab Control Sample	Total/NA	Air	Split	45299
LCSD 140-45299/3-B	Lab Control Sample Dup	Total/NA	Air	Split	45299

Prep Batch: 45516

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21303-3	Q-1566 QC VEN CB M0010 IMPINGERS 1,2&3	Total/NA	Air	None	
140-21303-5	Q-1569 QC VEN CB M0010 DI WATER RB	Total/NA	Air	None	
MB 140-45516/1-B	Method Blank	Total/NA	Air	None	
LCS 140-45516/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-45516/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Cleanup Batch: 45531

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21303-3	Q-1566 QC VEN CB M0010 IMPINGERS 1,2&3	Total/NA	Air	Split	45516
140-21303-5	Q-1569 QC VEN CB M0010 DI WATER RB	Total/NA	Air	Split	45516
MB 140-45516/1-B	Method Blank	Total/NA	Air	Split	45516
LCS 140-45516/2-B	Lab Control Sample	Total/NA	Air	Split	45516
LCSD 140-45516/3-B	Lab Control Sample Dup	Total/NA	Air	Split	45516

Analysis Batch: 45544

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21303-3	Q-1566 QC VEN CB M0010 IMPINGERS 1,2&3	Total/NA	Air	537 (modified)	45531
140-21303-5	Q-1569 QC VEN CB M0010 DI WATER RB	Total/NA	Air	537 (modified)	45531
MB 140-45516/1-B	Method Blank	Total/NA	Air	537 (modified)	45531

QC Association Summary

Client: The Chemours Company FC, LLC
 Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

LCMS (Continued)

Analysis Batch: 45544 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 140-45516/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	45531
LCSD 140-45516/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	45531

Cleanup Batch: 45592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21303-1	Q-1562,1563 QC VEN CB M0010 FH BT	Total/NA	Air	Split	45356
140-21303-9	A-7264 MEDIA CHECK FILTER	Total/NA	Air	Split	45356
MB 140-45356/1-B	Method Blank	Total/NA	Air	Split	45356
LCS 140-45356/2-B	Lab Control Sample	Total/NA	Air	Split	45356
LCSD 140-45356/3-B	Lab Control Sample Dup	Total/NA	Air	Split	45356

Analysis Batch: 45601

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21303-2	Q-1564,1565,1567 QC VEN CB M0010 BH BT	Total/NA	Air	537 (modified)	45468
140-21303-4	Q-1568 QC VEN CB M0010 BREAKTHROUGH >	Total/NA	Air	537 (modified)	45468
140-21303-6	Q-1570 QC VEN CB M0010 MEOH WITH 5% NH	Total/NA	Air	537 (modified)	45468
140-21303-7	Q-1571 QC VEN CB M0010 COMBINED GLASS	Total/NA	Air	537 (modified)	45468
140-21303-8	A-7263 MEDIA CHECK XAD	Total/NA	Air	537 (modified)	45468
MB 140-45299/14-B	Method Blank	Total/NA	Air	537 (modified)	45468
MB 140-45299/1-B	Method Blank	Total/NA	Air	537 (modified)	45468
LCS 140-45299/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	45468
LCSD 140-45299/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	45468

Analysis Batch: 45773

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-21303-1	Q-1562,1563 QC VEN CB M0010 FH BT	Total/NA	Air	537 (modified)	45592
140-21303-9	A-7264 MEDIA CHECK FILTER	Total/NA	Air	537 (modified)	45592
MB 140-45356/1-B	Method Blank	Total/NA	Air	537 (modified)	45592
LCS 140-45356/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	45592
LCSD 140-45356/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	45592

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

Client Sample ID: Q-1562,1563 QC VEN CB M0010 FH BT

Lab Sample ID: 140-21303-1

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45773	01/04/21 15:30	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Q-1564,1565,1567 QC VEN CB M0010 BH BT

Lab Sample ID: 140-21303-2

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 11:36	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Q-1566 QC VEN CB M0010 IMPINGERS 1,2&3 COND BT

Lab Sample ID: 140-21303-3

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 22:17	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Q-1568 QC VEN CB M0010 BREAKTHROUGH XAD-2 RESIN TUBE BT

Lab Sample ID: 140-21303-4

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 11:46	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Q-1569 QC VEN CB M0010 DI WATER RB

Lab Sample ID: 140-21303-5

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 22:43	JRC	TAL KNX
Instrument ID: LCA										

Eurofins TestAmerica, Knoxville

Lab Chronicle

Client: The Chemours Company FC, LLC
Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

Client Sample ID: Q-1570 QC VEN CB M0010 MEOH WITH 5% NH4OH RB

Lab Sample ID: 140-21303-6

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 11:54	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Q-1571 QC VEN CB M0010 COMBINED GLASSWARE RINSES (MEOH/5% NH4OH) PB

Lab Sample ID: 140-21303-7

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 12:03	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: A-7263 MEDIA CHECK XAD

Lab Sample ID: 140-21303-8

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 13:32	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: A-7264 MEDIA CHECK FILTER

Lab Sample ID: 140-21303-9

Date Collected: 12/09/20 00:00

Matrix: Air

Date Received: 12/10/20 06:25

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	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45773	01/04/21 15:56	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-45299/14-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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 11:06	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

Client Sample ID: Method Blank

Lab Sample ID: MB 140-45299/1-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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 08:53	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-45356/1-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	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45773	01/04/21 14:10	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-45516/1-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	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 20:57	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-45299/2-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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 09:02	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-45356/2-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	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45773	01/04/21 14:19	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-45516/2-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	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 21:06	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-45299/3-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	45299	12/15/20 14:18	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	45468	12/21/20 06:28	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45601	12/24/20 09:11	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-45356/3-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	45356	12/16/20 12:02	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	45592	12/24/20 04:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45773	01/04/21 14:28	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-45516/3-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	45516	12/22/20 10:02	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	45531	12/22/20 12:21	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			45544	12/22/20 21:15	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
 Project/Site: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

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	06-30-21
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	01-01-21 *
Louisiana	NELAP	83979	06-30-21
Louisiana (DW)	State	LA019	12-31-21
Maryland	State	277	03-31-21
Michigan	State	9933	12-11-22
Nevada	State	TN00009	07-31-21
New Hampshire	NELAP	299919	01-17-21
New Jersey	NELAP	TN001	07-01-21
New York	NELAP	10781	03-31-21
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	01-19-21
West Virginia (DW)	State	9955C	01-01-21 *
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: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

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: Quarter 4 Field QC - M0010

Job ID: 140-21303-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-21303-1	Q-1562,1563 QC VEN CB M0010 FH BT	Air	12/09/20 00:00	12/10/20 06:25	
140-21303-2	Q-1564,1565,1567 QC VEN CB M0010 BH BT	Air	12/09/20 00:00	12/10/20 06:25	
140-21303-3	Q-1566 QC VEN CB M0010 IMPINGERS 1,2&3 COND BT	Air	12/09/20 00:00	12/10/20 06:25	
140-21303-4	Q-1568 QC VEN CB M0010 BREAKTHROUGH XAD-2 RESIN TUBE BT	Air	12/09/20 00:00	12/10/20 06:25	
140-21303-5	Q-1569 QC VEN CB M0010 DI WATER RB	Air	12/09/20 00:00	12/10/20 06:25	
140-21303-6	Q-1570 QC VEN CB M0010 MEOH WITH 5% NH4OH RB	Air	12/09/20 00:00	12/10/20 06:25	
140-21303-7	Q-1571 QC VEN CB M0010 COMBINED GLASSWARE RINSES (MEOH/5% NH4OH) PB	Air	12/09/20 00:00	12/10/20 06:25	
140-21303-8	A-7263 MEDIA CHECK XAD	Air	12/09/20 00:00	12/10/20 06:25	
140-21303-9	A-7264 MEDIA CHECK FILTER	Air	12/09/20 00:00	12/10/20 06:25	

Request for Analysis/Chain-of-Custody – RFA/COC #003
The Chemours Company – Fayetteville NC Facility
PFAS Testing on PPA Carbon Bed Field QC Samples



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

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

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 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 Reports and in data packages. Include "Field Sample Number", "Sample Type", and "Run Number" on all TALS Reports.

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



140-21303 Chain of Custody

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Q-1562 QC VEN CB M0010 Filter BT	QC	12/9/20	Blank Train	125 mL HDPE Wide-Mouth Bottle	Particulate Filter (82.6 mm Whatman Glass Microfiber) Method 0010 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.
Q-1563 QC VEN CB M0010 FH of Filter Holder & Probe MeOH Rinse BT	QC	12/9/20	Blank Train	125 mL HDPE Wide-Mouth Bottle	Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse Method 0010 Blank Train HFPO-DA & PFOA Analysis	Knoxville: Use this solvent sample in the Filter extraction.
Q-1564 QC VEN CB M0010 XAD-2 Resin Tube BT	QC	12/9/20	Blank Train	XAD-2 Resin Tube	XAD-2 Resin Tube Method 0010 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.

Request for Analysis/Chain-of-Custody – RFA/COC #003
The Chemours Company – Fayetteville NC Facility
PFAS Testing on PPA Carbon Bed Field QC Samples



Environment Testing
 TestAmerica

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Q-1565 QC VEN CB M0010 BH of Filter Holder & Coil Condenser MeOH Rinse BT	QC	12/9/20	Blank Train	125 mL HDPE Wide- Mouth Bottle	Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse Method 0010 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.
Q-1566 QC VEN CB M0010 Impingers 1,2 & 3 Condensate BT	QC	12/9/20	Blank Train	500 mL HDPE Wide- Mouth Bottle	Impinger #1, #2 & #3 Condensate Method 0010 Blank Train HFPO-DA & PFOA Analysis	Knoxville: Measure the total volume of the Impinger Composite. Analyze for HFPO-DA and PFOA.
Q-1567 QC VEN CB M0010 Impinger Glassware MeOH Rinse BT	QC	12/9/20	Blank Train	250 mL HDPE Wide- Mouth Bottle	Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse Method 0010 Blank Train HFPO-DA & PFOA Analysis	Knoxville: Use this solvent sample in the XAD-2 Resin Extraction.
Q-1568 QC VEN CB M0010 Breakthrough XAD-2 Resin Tube BT	QC	12/9/20	Blank Train	XAD-2 Resin Tube	Breakthrough XAD-2 Resin Tube Method 0010 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.
Q-1569 QC VEN CB M0010 DI Water RB	QC	12/9/20	Reagent Blank	500 mL HDPE Wide- Mouth Bottle	Deionized (DI) Water Reagent Blank Method 0010 Train HFPO-DA & PFOA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Knoxville: Analyze for HFPO-DA and PFOA.
Q-1570 QC VEN CB M0010 MeOH with 5% NH ₄ OH RB	QC	12/9/20	Reagent Blank	250 mL HDPE Wide- Mouth Bottle	Methanol with 5% NH₄OH Reagent Blank Method 0010 Train HFPO-DA & PFOA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Knoxville: Analyze for HFPO-DA and PFOA.

Request for Analysis/Chain-of-Custody – RFA/COC #003
 The Chemours Company – Fayetteville NC Facility
 PFAS Testing on PPA Carbon Bed Field QC Samples



Environment Testing
 TestAmerica

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- 2
- 3
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Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Q-1571 QC VEN CB M0010 Combined Glassware Rinses (MeOH/5% NH ₄ OH) PB	QC	12/9/20	Proof Blank	125 mL HDPE Wide- Mouth Bottle	Front Half, Back Half and Impinger Glassware Rinses Composite Proof Blank Method 0010 Train HFPO-DA & PFOA Analysis	<u>Knoxville:</u> Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. <u>Knoxville:</u> Analyze for HFPO-DA and PFOA.

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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 11/17/20
- (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:

Relinquished By:	<u>Pattin Gray</u> Name	<u>Ramboll</u> Company	<u>12/9/20 2030</u> Date/Time
Accepted By:	<u>Doug Cahill</u> Name	<u>ETA KNOX</u> Company	<u>12/9/20 2030</u> Date/Time
Relinquished By:	<u>Doug Cahill</u> Name	<u>ETA KNOX</u> Company	<u>12/10/20 0625</u> Date/Time
Accepted By:	<u>Murphy</u> Name	<u>ETA KNOX</u> Company	<u>12-10-20 06:25</u> Date/Time
Relinquished By:	_____ Name	_____ Company	_____ Date/Time
Accepted By:	_____ Name	_____ Company	_____ Date/Time
Relinquished By:	_____ Name	_____ Company	_____ Date/Time
Accepted By:	_____ Name	_____ Company	_____ Date/Time

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

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Are the shipping containers intact?	/			<input type="checkbox"/> Containers, Broken	
2. Were ambient air containers received intact?			/	<input type="checkbox"/> Checked in lab	
3. The coolers/containers custody seal if present, is it intact?			/	<input type="checkbox"/> Yes <input type="checkbox"/> NA	
4. Is the cooler temperature within limits? (> freezing temp. of water to 6°C, VOST: 10°C) Thermometer ID : <u>5668</u> Correction factor: <u>+0.1°C</u>	/			<input type="checkbox"/> Cooler Out of Temp, Client Contacted, Proceed/Cancel <input type="checkbox"/> Cooler Out of Temp, Same Day Receipt	
5. Were all of the sample containers received intact?	/			<input type="checkbox"/> Containers, Broken	
6. Were samples received in appropriate containers?	/			<input type="checkbox"/> Containers, Improper; Client Contacted; Proceed/Cancel	
7. Do sample container labels match COC? (IDs, Dates, Times)	/			<input type="checkbox"/> COC & Samples Do Not Match <input type="checkbox"/> COC Incorrect/Incomplete <input type="checkbox"/> COC Not Received	
8. Were all of the samples listed on the COC received?	/			<input type="checkbox"/> Sample Received, Not on COC <input type="checkbox"/> Sample on COC, Not Received	
9. Is the date/time of sample collection noted?	/			<input type="checkbox"/> COC; No Date/Time; Client Contacted	Labeling Verified by: _____ Date: _____
10. Was the sampler identified on the COC?	/			<input type="checkbox"/> Sampler Not Listed on COC	
11. Is the client and project name/# identified?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
12. Are tests/parameters listed for each sample?	/			<input type="checkbox"/> COC No tests on COC	pH test strip lot number: _____
13. Is the matrix of the samples noted?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
14. Was COC relinquished? (Signed/Dated/Timed)	/			<input type="checkbox"/> COC Incorrect/Incomplete	Box 16A: pH Preservation Box 18A: Residual Chlorine
15. Were samples received within holding time?	/			<input type="checkbox"/> Holding Time - Receipt	Preservative: _____
16. Were samples received with correct chemical preservative (excluding Encore)?			/	<input type="checkbox"/> pH Adjusted, pH Included (See box 16A) <input type="checkbox"/> Incorrect Preservative	Lot Number: _____ Exp Date: _____ Analyst: _____
17. Were VOA samples received without headspace?			/	<input type="checkbox"/> Headspace (VOA only)	Date: _____ Time: _____
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number: _____			/	<input type="checkbox"/> Residual Chlorine	
19. For 1613B water samples is pH<9?			/	<input type="checkbox"/> If no, notify lab to adjust	
20. For rad samples was sample activity info. Provided?			/	<input type="checkbox"/> Project missing info	
Project #: _____ PM Instructions: _____					

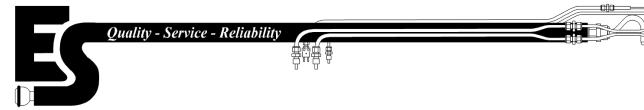
Sample Receiving Associate: Ronald Johnson Date: 12-12-20 QA026R32.doc, 062719



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.

DATE: 1/15/2020 METER SERIAL #: M3 BAROMETRIC PRESSURE (in Hg): INITIAL 29.59 FINAL 29.59 AVG (P_{bar}) 29.59
 METER PART #: CRITICAL ORIFICE SET SERIAL #: 1393

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT ³)					TEMPERATURES °F					ELAPSED TIME (MIN) q	DGM DH (in H ₂ O)	(1) V _m (STD)	(2) V _{cr} (STD)	(3) Y	Y % Diff to Average Y	Y % Diff with other orifices	DH _⊕
				DGM READINGS (FT ³)			TEMPERATURES °F														
				INITIAL	FINAL	NET (V _m)	AMBIENT	DGM INLET	DGM OUTLET	DGM	AVG										
11	1	0.306	24	993.117	999.052	5.935	70.7	70	71	68	69	69.5	15.00	0.43	5.8603	5.8974	1.006				
	2	0.306																			
	3	0.306																			
							AVG =								1.006	0.23	0.67				
16	1	0.4268	22.5	987.575	993.117	5.542	70.7	70	70	67	68	68.75	10.00	0.86	5.4858	5.4837	1.000				
	2	0.4268																			
	3	0.4268																			
							AVG =								1.000	-0.44	-0.67				
18	1	0.4961	21.5	999.052	1,005.432	6.380	70.3	70	71	68	70	69.75	10.00	1.2	6.3087	6.3765	1.011				
	2	0.4961																			
	3	0.4961																			
							AVG =								1.011	0.67	1.57				
26	1	0.7131	19	971.683	980.920	9.237	70	69	69	64	66	67	10.00	2.6	9.2133	9.1682	0.995				
	2	0.7131																			
	3	0.7131																			
							AVG =								0.995	-0.89	-1.30				
31	1	0.8358	17.5	961.057	971.683	10.626	69.5	64	69	63	64	65	10.00	3.5	10.6628	10.7508	1.008				
	2	0.8358																			
	3	0.8358																			
							AVG =								1.008	0.42	1.32				

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 = 1.004

AVERAGE DH_⊕ = 1.64

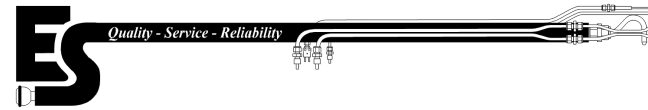
(1) $V_{m(std)} = K_1 * V_m * \frac{Pbar + (\Delta H / 13.6)}{T_m}$ = Net volume of gas sample passed through DGM, corrected to standard conditions
 K₁ = 17.64 °R/in. Hg (English), 0.3858 °K/mm Hg (Metric)
 T_m = Absolute DGM avg. temperature (°R - English, °K - Metric)

(2) $V_{cr(std)} = K' * \frac{Pbar * \Theta}{\sqrt{T_{amb}}}$ = 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) $Y = \frac{V_{cr(std)}}{V_{m(std)}}$ = DGM calibration factor

$DH_{\oplus} = \left(\frac{0.75 \text{ g}}{V_{cr(std)}} \right)^2 DH \left(\frac{V_m(std)}{V_m} \right)$

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.

DATE: 1/15/2020 METER SERIAL #: MB 8 BAROMETRIC PRESSURE (in Hg): INITIAL 30.19 FINAL 30.19 AVG (P_{bar}) 30.19
 METER PART #: 13276842 CRITICAL ORIFICE SET SERIAL #: 1393

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT ³)			TEMPERATURES °F					ELAPSED TIME (MIN) q	DGM DH (in H ₂ O)	(1) V _m (STD)	(2) V _{cr} (STD)	(3) Y	Y % Diff to Average Y	Y % Diff with other orifices	DH ₀					
				INITIAL	FINAL	NET (V _m)	AMBIENT	DGM INLET		DGM OUTLET										DGM AVG				
								INITIAL	FINAL	INITIAL	FINAL													
11	1	0.306	23.5	151.919	158.115	6.196	70.5	76	78	75	76	76.25	15.00	0.44	6.1634	6.0181	0.976	0.16	0.66	1.53				
	2																							
	3																							
															AVG =		0.976							
16	1	0.4268	22.5	158.115	163.916	5.801	71	77	79	76	77	77.25	10.00	0.9	5.7662	5.5933	0.970	-0.50	-0.66	1.61				
	2																							
	3																							
															AVG =		0.970							
18	1	0.4961	21.5	163.916	170.574	6.658	71.1	79	80	77	78	78.5	10.00	1.1	6.6059	6.5009	0.984	0.94	1.51	1.45				
	2																							
	3																							
															AVG =		0.984							
26	1	0.7131	19	170.654	180.354	9.70	71.1	80	81	78	79	79.5	10.00	2.5	9.6389	9.3444	0.969	-0.56	-0.52	1.60				
	2																							
	3																							
															AVG =		0.969							
31	1	0.8358	17.5	180.354	191.665	11.311	71.4	81	84	79	80	81	10.00	3.5	11.2357	10.9492	0.974	-0.04	0.52	1.63				
	2																							
	3																							
															AVG =		0.974							

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 = 0.975

AVERAGE DH₀ = 1.56

(1) $V_{m(std)} = K_1 * V_m * \frac{Pbar + (\Delta H / 13.6)}{T_m}$ = Net volume of gas sample passed through DGM, corrected to standard conditions
 K₁ = 17.64 °R/in. Hg (English), 0.3858 °K/mm Hg (Metric)
 T_m = Absolute DGM avg. temperature (°R - English, °K - Metric)

(2) $V_{cr(std)} = K' * \frac{Pbar * \Theta}{\sqrt{T_{amb}}}$ = 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) $Y = \frac{V_{cr(std)}}{V_{m(std)}}$ = DGM calibration factor

$DH_0 = \left(\frac{0.75 q}{V_{cr(std)}} \right)^2 DH \left(\frac{V_m(std)}{V_m} \right)$

Initial Impinger Outlet Thermocouple Calibration

ID Number	Ice Bath			Ambient			Hot Water Bath			Technician	Date Performed
	Reference Temperature (°Rk)	Thermocouple Temperature (°Rk)	Deviation*	Reference Temperature (°Rk)	Thermocouple Temperature (°Rk)	Deviation*	Reference Temperature (°Rk)	Thermocouple Temperature (°Rk)	Deviation*		
IO-1	491.67	493.67	0.4%	527.67	526.67	-0.2%	671.67	670.67	-0.1%	JLS	01/30/20
IO-2	491.67	493.67	0.4%	527.67	526.67	-0.2%	671.67	671.67	0.0%	JLS	01/30/20
IO-3	491.67	493.67	0.4%	527.67	526.67	-0.2%	671.67	670.67	-0.1%	JLS	01/30/20
IO-4	491.67	493.67	0.4%	527.67	526.67	-0.2%	671.67	669.67	-0.3%	JLS	01/30/20
IO-5	491.67	493.67	0.4%	527.67	526.67	-0.2%	671.67	671.67	0.0%	JLS	01/30/20
IO-6	491.67	493.67	0.4%	527.67	526.67	-0.2%	671.67	672.67	0.1%	JLS	01/30/20
IO-7	491.67	493.67	0.4%	527.67	526.67	-0.2%	671.67	670.67	-0.1%	JLS	01/30/20
IO-8	491.67	493.67	0.4%	527.67	527.67	0.0%	671.67	669.67	-0.3%	JLS	01/30/20
IO-9	491.67	493.67	0.4%	527.67	526.67	-0.2%	671.67	672.67	0.1%	JLS	01/30/20
IO-10	491.67	492.67	0.2%	527.67	526.67	-0.2%	671.67	672.67	0.1%	JLS	01/30/20
IO-11	491.67	493.67	0.4%	527.67	527.67	0.0%	671.67	672.67	0.1%	JLS	01/30/20
IO-12	491.67	492.67	0.2%	527.67	526.67	-0.2%	671.67	672.67	0.1%	JLS	01/30/20
IO-13	NA			NA			NA			JLS	01/30/20
IO-14	491.67	494.67	0.6%	527.67	526.67	-0.2%	671.67	670.67	-0.1%	JLS	01/30/20
IO-15	491.67	493.67	0.4%	527.67	527.67	0.0%	671.67	670.67	-0.1%	JLS	01/30/20
IO-16	491.67	493.67	0.4%	527.67	526.67	-0.2%	671.67	671.67	0.0%	JLS	01/30/20
IO-17	NA			NA			NA			JLS	01/30/20
IO-18	491.67	493.67	0.4%	527.67	527.67	0.0%	671.67	669.67	-0.3%	JLS	01/30/20
IO-19	491.67	493.67	0.4%	527.67	526.67	-0.2%	671.67	671.67	0.0%	JLS	01/30/20

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



Initial Oven Box Thermocouple Calibration

ID Number	Ice Bath			Ambient			Hot Water Bath			Technician	Date Performed
	Reference Temperature (°R)	Thermocouple Temperature (°R)	Deviation*	Reference Temperature (°R)	Thermocouple Temperature (°R)	Deviation*	Reference Temperature (°R)	Thermocouple Temperature (°R)	Deviation*		
OB-1	491.67	492.67	0.2%	524.67	523.67	-0.2%	671.67	673.67	0.3%	JLS	01/17/20
OB-2	491.67	492.67	0.2%	524.67	524.67	0.0%	671.67	669.67	-0.3%	JLS	01/17/20
OB-3	491.67	492.67	0.2%	524.67	524.67	0.0%	671.67	669.67	-0.3%	JLS	01/17/20
OB-4	491.67	493.67	0.4%	524.67	524.67	0.0%	671.67	670.67	-0.1%	JLS	01/17/20
OB-A	491.67	492.67	0.2%	524.67	526.67	0.4%	671.67	673.67	0.3%	JLS	01/17/20
OB-B	491.67	492.67	0.2%	524.67	526.67	0.4%	671.67	672.67	0.1%	JLS	01/17/20
OB-5	491.67	494.67	0.6%	524.67	523.67	-0.2%	671.67	669.67	-0.3%	JLS	01/17/20
OB-C	491.67	492.67	0.2%	524.67	525	0.0%	671.67	673.67	0.3%	JLS	01/17/20
OB-6	491.67	493.67	0.4%	524.67	525	0.0%	671.67	669.67	-0.3%	JLS	01/17/20
OB-7	491.67	494.67	0.6%	524.67	525	0.0%	671.67	671.67	0.0%	JLS	01/17/20
OB-E	491.67	494	0.4%	524.67	528	0.6%	671.67	668.67	-0.4%	JLS	01/17/20
OB-10	491.67	493.67	0.4%	524.67	525.67	0.2%	671.67	671.67	0.0%	JLS	01/17/20
OB-11	491.67	493.67	0.4%	524.67	525.67	0.2%	671.67	671.67	0.0%	JLS	01/17/20

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



Initial Sample Probe Calibration Form

 Probe ID P4-2/TC-5D

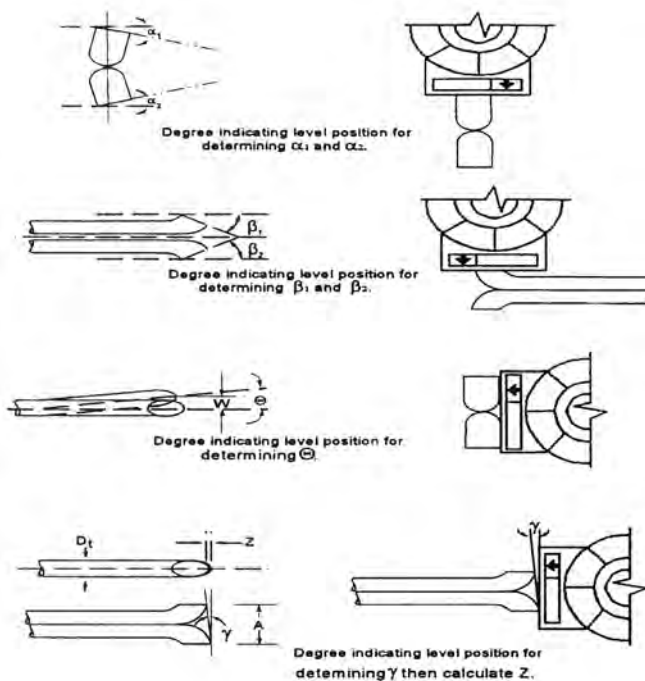
 Date 06/16/20

 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° = α_1 = + 10°)	2
α_2 (-10° = α_2 = + 10°)	1
β_1 (-5° = β_1 = + 5°)	1
β_2 (-5° = β_2 = + 5°)	1
γ	1
θ	0
$z = A \tan \gamma$ (< 0.125")	0.011
$W = A \tan \theta$ (< 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

A. Bottom View; showing minimum pitot tube-nozzle separation.

Does X Exceed 0.75 inches? Yes

Does Y Exceed 3 inches? NA

B. Side View; to prevent pitot tube from interfering with gas flow streamlines approaching the nozzle, the impact pressure opening plane of the pitot tube shall be even with or above the nozzle entry plane.

Thermocouple Calibration

	Ice Bath °R				Ambient °R				Boiling Water °R		
	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 IC P4-2/TC-5D meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube calibration factor C_p of 0.84.

 Certified By: P. Grady

 Date: 06/16/20

Initial Sample Probe Calibration Form

 Probe ID P4-3/TC-7D

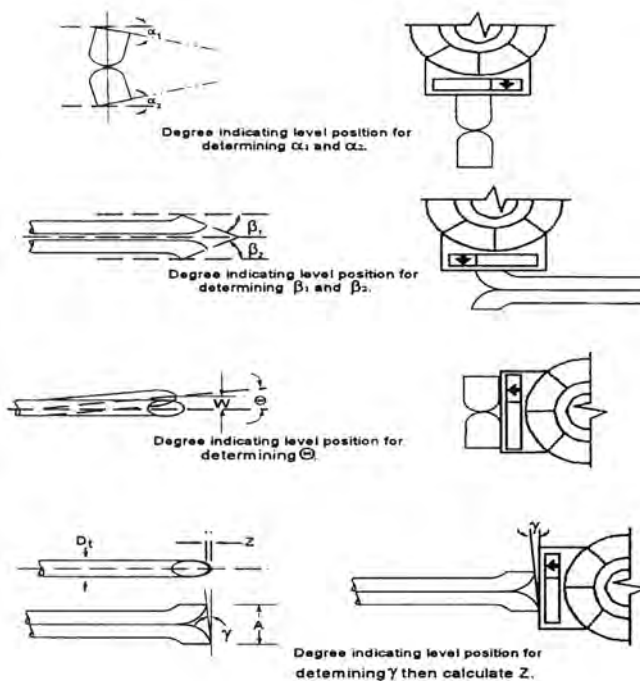
 Date 06/16/20

 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° = α_1 = + 10°)	1
α_2 (-10° = α_2 = + 10°)	0
β_1 (-5° = β_1 = + 5°)	1
β_2 (-5° = β_2 = + 5°)	1
γ	1
θ	1
$Z = A \tan \gamma$ (< 0.125")	0.011
$W = A \tan \theta$ (< 0.03125")	0.0110
D_t (3/16 = D_t = 3/8")	0.251
A	0.628
$A/2D_t$ (1.05 = P_A/D_t = 1.5)	1.251

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

A. Bottom View; showing minimum pitot tube-nozzle separation.

Does X Exceed 0.75 inches? Yes

Does Y Exceed 3 inches? NA

B. Side View; to prevent pitot tube from interfering with gas flow streamlines approaching the nozzle, the impact pressure opening plane of the pitot tube shall be even with or above the nozzle entry plane.

$Y \geq 7.62 \text{ cm (3 in.)}$

Thermocouple Calibration

	Ice Bath °R				Ambient °R				Boiling Water °R		
	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	492.7	492.6	492.6		533.1	533.2	533.2		671.8	671.8	671.8
Difference (%)	0.1	0.1	0.1		-0.1	0.0	0.0		0.0	0.0	0.0

Temperature values must be within 1.5% of reference temperature

I certify that the probe IC P4-3/TC-7D meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube calibration factor C_p of 0.84.

 Certified By: P. Grady

 Date: 06/16/20

Nozzle Calibration Form

Plant I.D. Chemours

Project No. 100388

Source I.D. VEN Inlet

Personnel PG/JLS

Date _____

Nozzle ID:	Stainless Steel
Diameter 1	0.246
Diameter 2	0.245
Diameter 3	0.245
Average	0.245

< 0.004" between high & low diameters

Nozzle Calibration Form

Plant I.D. Chemours

Project No. 100388

Source I.D. VEN Outlet

Personnel PG/JLS

Date _____

Nozzle ID:	Stainless Steel
Diameter 1	0.247
Diameter 2	0.245
Diameter 3	0.244
Average	0.245

< 0.004" between high & low diameters

Post Test Equipment Calibration Data

POST TEST DRY GAS METER CALIBRATION

DATE: 01/19/21 METER BOX #: 3 BAROMETRIC PRESSURE (in Hg): 30.01 30.01 AVG (P_{bar}) 30.01
 TECHNICIAN: A. Anderson CRITICAL ORIFICE SET SERIAL #: 1393

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT ³)			TEMPERATURES °F					ELAPSED TIME (MIN) q	DGM DH (in H ₂ O)	(1) V _m (STD)	(2) V _{cr} (STD)	(3) Y	Y % Diff to Average Y	DH _g		
				INITIAL	FINAL	NET (V _m)	AMBIENT	DGM INLET		DGM OUTLET									DGM AVG	
								INITIAL	FINAL	INITIAL	FINAL									
	1																			
	2																			
	3																			
18	1	0.4961	21	855.649	862.094	6.445	61	59	61	59	60	59.75	10.00	1.2	6.5876	6.5245	0.990	-0.17	1.62	
	2	0.4961	21	862.094	868.541	6.447	61	61	62	60	61	61	10.00	1.2	6.5738	6.5245	0.992	0.04	1.62	
	3	0.4961	21	868.541	874.992	6.451	61	62	63	61	61	61.75	10.00	1.2	6.5684	6.5245	0.993	0.12	1.61	
AVG =																				
AVG =																				
	1																			
	2																			
	3																			
AVG =																				

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = 0.992

PRE-DETERMINED DRY GAS METER CALIBRATION FACTOR, Y = 1.004

PERCENT DIFFERENCE = -1.2

POST TEST DRY GAS METER CALIBRATION

DATE: 01/07/21 METER BOX #: 8 BAROMETRIC PRESSURE (in Hg): 30.05 30.5 30.275
 TECHNICIAN: S. Milo CRITICAL ORIFICE SET SERIAL #: 1393

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT ³)					TEMPERATURES °F					ELAPSED TIME (MIN) q	DGM DH (in H ₂ O)	(1) V _m (STD)	(2) V _{cr} (STD)	(3) Y	Y % Diff to Average Y	DH ₀	
				DGM READINGS (FT ³)			DGM INLET		DGM OUTLET		DGM AVG	DGM INLET	DGM OUTLET								DGM AVG
				INITIAL	FINAL	NET (V _m)	INITIAL	FINAL	INITIAL	FINAL											
	1																				
	2																				
	3																				
AVG =																					
18	1	0.4961	22	277.777	284.478	6.701	75	72	74	72	73	72.75	10.00	1.1	6.7392	6.4953	0.964	0.06	1.47		
18	2	0.4961	22	284.487	291.210	6.723	75	74	76	73	75	74.5	10.00	1.1	6.7392	6.4953	0.964	0.07	1.47		
18	3	0.4961	22	291.230	297.963	6.733	77	75	77	74	75	75.25	10.00	1.1	6.7398	6.4832	0.962	-0.13	1.47		
AVG = 0.963																					
	1																				
	2																				
	3																				
AVG =																					

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = 0.963

PRE-DETERMINED DRY GAS METER CALIBRATION FACTOR, Y = 0.975

PERCENT DIFFERENCE = -1.2



Post-Test Sample Probe Calibration Form

Probe ID P4-3 / TC7D

Visual Inspection	
Do pitot tips appear to be damaged?	<u> NO </u>
Do thermocouple wires appear broken or shorted?	<u> NO </u>
Do all components appear to be in good condition?	<u> YES </u>

Post-Test Thermocouple Calibration		
Reference Temperature °F	Thermocouple Temperature °F	Difference °F
<u> 55.8 </u>	<u> 57.6 </u>	<u> 1.8 </u>
s		
<small>Reference Thermocouple: Fluke S/N: 83450033 traceable to the United States National Institute of Standards and Technology</small>		

Acceptable Deviation +/- 2 °F

 X

Acceptable

Unacceptable

Date 01/15/21

Technician AA



Post-Test Sample Probe Calibration Form

Probe ID P4-2 / TC5D

Visual Inspection

Do pitot tips appear to be damaged? NO

Do thermocouple wires appear broken or shorted? NO

Do all components appear to be in good condition? YES

Post-Test Thermocouple Calibration

Reference Temperature °F

Thermocouple Temperature °F

Difference °F

 56

 57

 1

s

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

Acceptable Deviation +/- 2 °F

 X

Acceptable

Unacceptable

Date 01/15/21

Technician AA