FLUOROMONOMERS
MANUFACTURING PROCESS
VINYL ETHERS NORTH CARBON BED
REMOVAL EFFICIENCY TEST REPORT
TEST DATES: 26-28 FEBRUARY, 1 MARCH 2019

THE CHEMOURS COMPANY
FAYETTEVILLE, NORTH CAROLINA

Prepared for:

THE CHEMOURS COMPANY
22828 NC Hwy 87 W
Fayetteville, North Carolina 28306

Prepared by:

WESTON SOLUTIONS, INC.
1400 Weston Way
P.O. Box 2653
West Chester, Pennsylvania 19380

April 2019

W.O. No. 15418.002.010

TABLE OF CONTENTS

Section **Page**

LIST OF FIGURES

Title **Page**

LIST OF TABLES

Title **Page**

1. INTRODUCTION

1.1 FACILITY AND BACKGROUND INFORMATION

The Chemours Fayetteville Works (Chemours) is located in Bladen County, North Carolina, approximately 10 miles south of the city of Fayetteville. Chemours operating areas on the site include the Fluoromonomers, IXM and Polymers Processing Aid (PPA) manufacturing areas, Wastewater Treatment, and Powerhouse.

Chemours contracted Weston Solutions, Inc. (Weston) to perform HFPO Dimer Acid Fluoride, captured as HFPO Dimer Acid, emission testing on the Vinyl Ethers North (VEN) Carbon Bed at the facility. Testing was performed on 26-28 February and 1 March 2019 and generally followed the "Emission Test Protocol" reviewed and approved by the North Carolina Department of Environmental Quality (NCDEQ). This report provides the results from the emission test program.

1.2 TEST OBJECTIVES

The specific objectives for this test program were as follows:

- Measure the emissions concentrations and mass emissions rates of HFPO Dimer Acid Fluoride from the Carbon Bed inlet and outlet which are located in the Fluoromonomers process area.
- Calculate the Carbon Bed removal efficiency for HFPO Dimer Acid.
- Monitor and record process and emissions control data in conjunction with the test program.
- Provide representative emissions data.

1.3 TEST PROGRAM OVERVIEW

During the emissions test program, the concentrations and mass emissions rates of HFPO Dimer Acid were measured at two locations.

Table 1-1 provides a summary of the test locations and the parameters that were measured along with the sampling/analytical procedures that were followed.

Table 1-1
Sampling Plan for VEN Carbon Bed Testing

Sampling Point & Location	**VE North Carbon Bed**				
Number of Tests:	16 (8 Carbon Bed inlet, 8 Carbon Bed outlet)				
Parameters To Be Tested:	HFPO Dimer Acid (HFPO-DA)	Volumetric Flow Rate and Gas Velocity	Carbon Dioxide	Oxygen	Water Content
Sampling or Monitoring Method	EPA M-0010	EPA M1, M2, M3A, and M4 in conjunction with M-0010 tests	EPA M3/3A		EPA M4 in conjunction with M-0010 tests
Sample Extraction/ Analysis Method(s):	LC/MS/MS	NA[6]	NA		NA
Sample Size	≥ 1.5m[3]	NA	NA	NA	NA
Total Number of Samples Collected[1]	16	16	16	16	16
Reagent Blanks (Solvents, Resins)[1]	1 set	0	0	0	0
Field Blank Trains[1]	1 per source	0	0	0	0
Proof Blanks[1]	1 per train	0	0	0	0
Trip Blanks[1,2]	1 set	0	0	0	
Lab Blanks	1 per fraction[3]	0	0	0	0
Laboratory or Batch Control Spike Samples (LCS)	1 per fraction[3]	0	0	0	0
Laboratory or Batch Control Spike Sample Duplicate (LCSD)	1 per fraction[3]	0	0	0	0
Media Blanks	1 set[4]	0	0	0	0
Isotope Dilution Internal Standard Spikes	Each sample	0	0	0	0
Total No. of Samples	20[5]	16	16	16	16

Key:

[1] Sample collected in field.

[2] Trip blanks include one XAD-2 resin module and one methanol sample per sample shipment.

[3] Lab blank and LCS/LCSD includes one set per analytical fraction (front half, back half and condensate).

[4] One set of media blank archived at laboratory at media preparation.

[5] Actual number of samples collected in field.

[6] Not applicable.

Section 2 provides a summary of test results. A description of the processes is provided in Section 3. Section 4 provides a description of the test locations. The sampling and analytical procedures are provided in Section 5. Detailed test results and discussion are provided in Section 6.

Appendix C includes the summary reports for the laboratory analytical results. The full laboratory data packages are provided in electronic format and on CD with each hard copy.

2. SUMMARY OF TEST RESULTS

A total of eight test runs each were performed on the VEN Carbon Bed inlet and outlet. Table 2-1 provides a summary of the HFPO Dimer Acid emissions test results and Carbon Bed removal efficiencies. Detailed test results summaries are provided in Section 6.

It is important to note that emphasis is being placed on the characterization of the emissions based on the stack test results. Research conducted in developing the protocol for stack testing HFPO Dimer Acid Fluoride, HFPO Dimer Acid Ammonium Salt and HFPO Dimer Acid realized that the resulting testing, including collection of the air samples and extraction of the various fraction of the sampling train, would result in all three compounds being expressed as simply the HFPO Dimer Acid. However, it should be understood that the total HFPO Dimer Acid results provided on Table 2-1 and in this report include a percentage of each of the three compounds.

Table 2-1
Summary of HFPO Dimer Acid VEN Carbon Bed Test Results

Run Number and Condition	Inlet		Outlet		Removal Efficiency
	g/sec	lb/hr	g/sec	lb/hr	%
R1 ABR Op.	1.25E-02	9.96E-02	6.92E-05	5.50E-04	99.4
R2 Burnout Run	1.41E-02	1.12E-01	2.14E-05	1.70E-04	99.8
R3 ABR Off	6.58E-03	5.23E-02	3.15E-05	2.50E-04	99.5
R4 ABR Op.	7.11E-03	5.65E-02	1.42E-03	1.13E-02	80.0
R5 ABR Op.	6.41E-03	5.09E-02	6.30E-06	5.00E-05	99.9
R6 Burnout Run	7.11E-03	5.64E-02	8.81E-06	7.00E-05	99.9
R7 ABR Op.	5.97E-03	4.74E-02	5.04E-06	4.00E-05	99.9
R8 Burnout Run	4.39E-03	3.49E-02	6.30E-06	5.00E-05	99.9
Average	**8.02E-03**	**6.37E-02**	**1.96E-04**	**1.56E-03**	**97.3**

3. PROCESS DESCRIPTIONS

The Fluoromonomers area is included in the scope of this test program.

3.1 FLUOROMONOMERS

These facilities produce a family of fluorocarbon compounds used to produce Chemours products such as Nafion®, Krytox®, and Viton®, as well as sales to outside customers.

Process emissions are vented to the Division waste gas scrubber system (which includes the secondary scrubber) which then vents to the Carbon Bed and then to the Division Stack.

The VE North building air systems are also vented to the carbon bed and connected to the Tower Exhaust Blower.

3.2 PROCESS OPERATIONS AND PARAMETERS

The following table is a summary of the operation and products from the specific areas tested.

Source	Operation/Product	Batch or Continuous
VE North	PPVE	Condensation is continuous. Agitated Bed Reactor and Refining are batch.

During the test program, the following parameters were monitored by Chemours and are included in Appendix A.

- Fluoromonomers Process
  - VEN Precurser Rate
  - VEN Condensation Rate
  - VEN ABR Rate

The following table provides a summary of the process conditions established for each of the eight test runs:

Table 3-1
Test Campaign Process Conditions

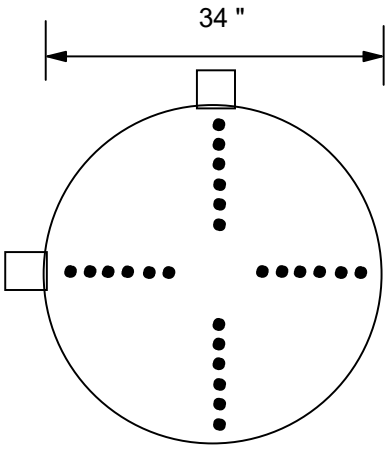
Run No.	Date	ABR
1	2/26/19	Feeding
2	2/26/19	Burnout
3	2/27/19	Off
4	2/27/19	Feeding
5	2/28/19	Feeding
6	2/28/19	Burnout
7	3/1/19	Feeding
8	3/1/19	Burnout

4. DESCRIPTION OF TEST LOCATIONS

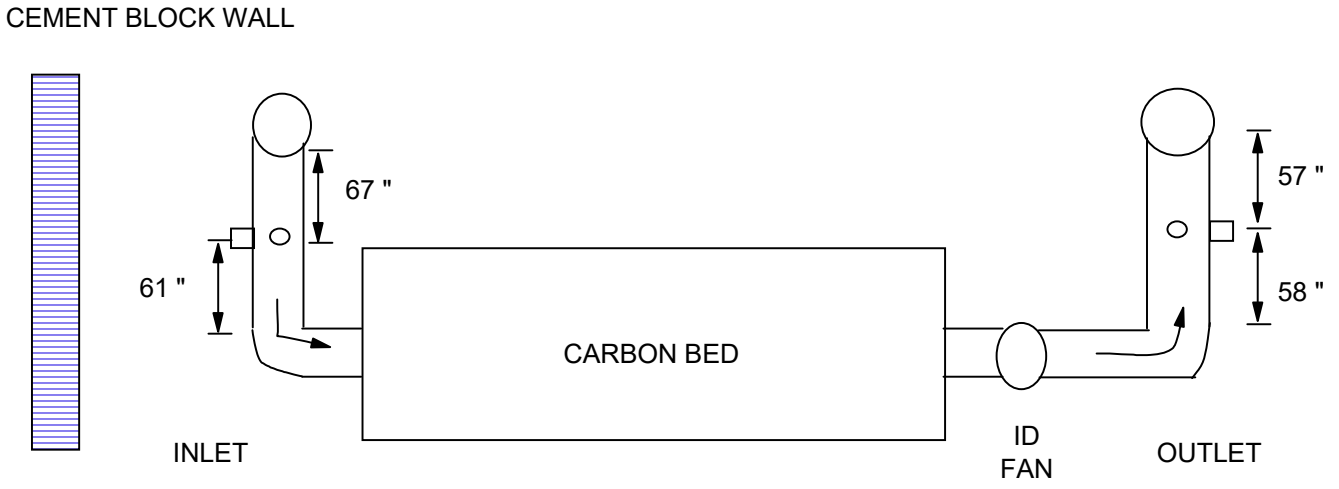
4.1 VINYL ETHERS NORTH CARBON BED INLET AND OUTLET

The fiberglass reinforced plastic (FRP) ducts at the inlet and outlet of the carbon bed are 34" ID. The test ports are located as shown below. Based on EPA Method 1, a total of 24 traverse points (12 per port) were required for HFPO Dimer Acid sampling at both locations. Figure 4-1 provides a schematic of the test port and traverse port locations.

Location	Distance from Flow Disturbance	
	Downstream (B)	Upstream (A)
Carbon Bed Inlet	67 inches > 1.9 duct diameters	61 inches > 1.8 duct diameters
Carbon Bed Outlet	58 inches > 1.7 duct diameters	57 inches > 1.5 duct diameters



TRAVERSE POINT NUMBER	DISTANCE FROM INSIDE NEAR WALL (INCHES)
1	3/4
2	2 1/4
3	4
4	6
5	8 1/2
6	12 1/8
7	21 5/8
8	25 1/2
9	28
10	30
11	31 3/4
12	33 1/4



DRAWING NOT TO SCALE

FIGURE 4-1
VE NORTH PROCESS CARBON BED INLET AND OUTLET SCHEMATIC

5. SAMPLING AND ANALYTICAL METHODS

5.1 STACK GAS SAMPLING PROCEDURES

The purpose of this section is to describe the stack gas emissions sampling trains and to provide details of the stack sampling and analytical procedures utilized during the emissions test program.

5.1.1 Pre-Test Determinations

Preliminary test data were obtained at each test location. Stack geometry measurements were measured and recorded, and traverse point distances verified. A preliminary velocity traverse was performed utilizing a calibrated S-type pitot tube and an inclined manometer to determine velocity profiles. Flue gas temperatures were observed with a calibrated direct readout panel meter equipped with a chromel-alumel thermocouple. Preliminary water vapor content was estimated by wet bulb/dry bulb temperature measurements.

A check for the presence or absence of cyclonic flow was previously conducted at each test location. The cyclonic flow checks were negative (< 20°) verifying that the test locations were acceptable for testing.

Preliminary test data was used for nozzle sizing and sampling rate determinations for isokinetic sampling procedures.

Calibration of probe nozzles, pitot tubes, metering systems, and temperature measurement devices was performed as specified in Section 5 of EPA Method 5 test procedures.

5.2 STACK PARAMETERS

5.2.1 EPA Method 0010

The sampling train utilized to perform the HFPO Dimer Acid sampling at the outlet locations was an EPA Method 0010 train (see Figure 5-1). The Method 0010 consisted of a borosilicate nozzle that attached directly to a heated borosilicate probe. In order to minimize possible thermal degradation of the HFPO Dimer Acid, the probe and particulate filter were heated above stack temperature to minimize water vapor condensation before the filter. The probe was connected directly to a heated borosilicate filter holder containing a solvent extracted glass fiber filter.

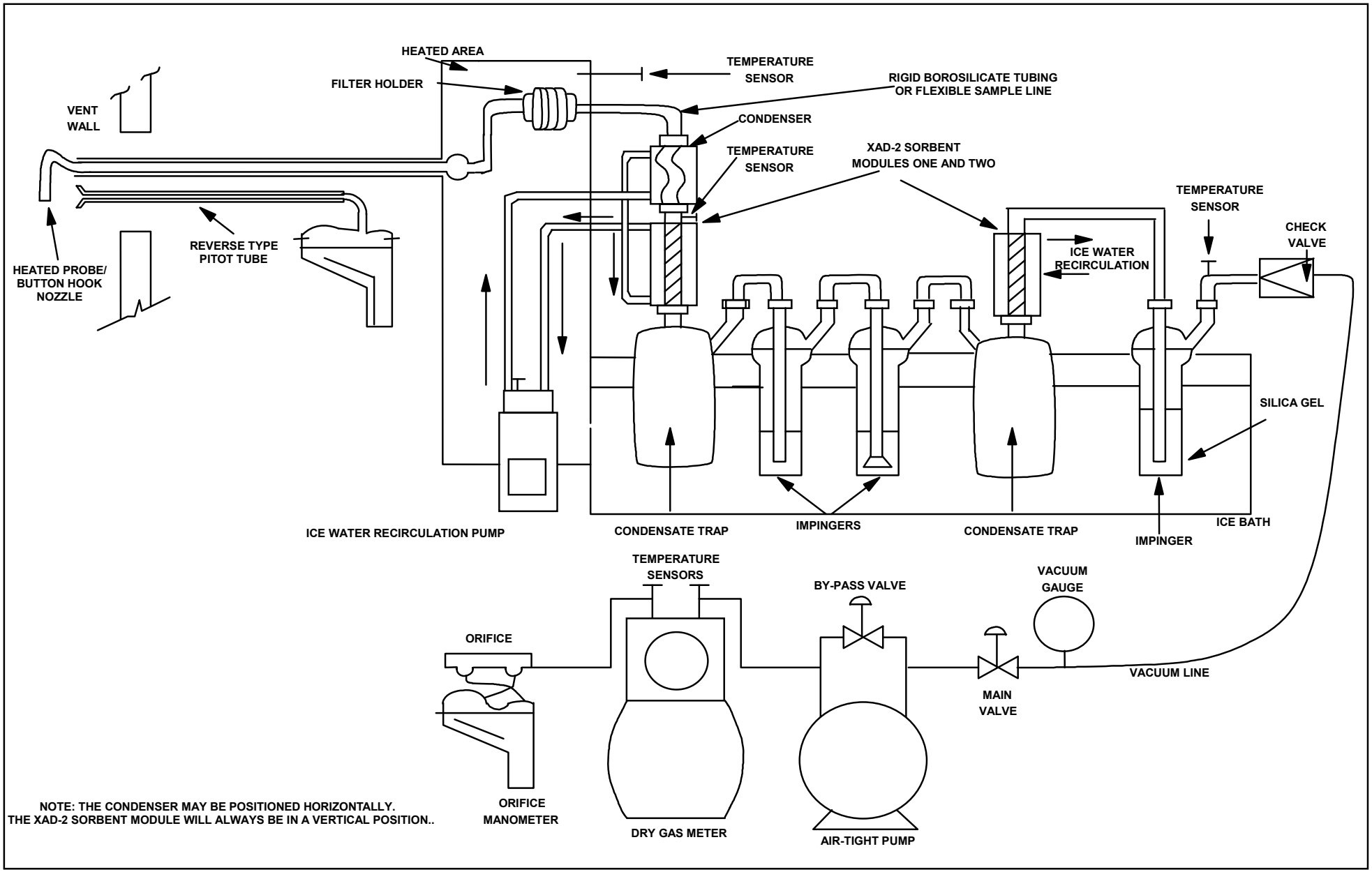


FIGURE 5-1
EPA METHOD 0010 SAMPLING TRAIN

IASDATA\CHEMOURS\15418.002.010\FIGURE 5-1 METHOD 0010

A section of borosilicate glass or flexible polyethylene tubing connected the filter holder exit to a Grahm (spiral) type ice water-cooled condenser, an ice water-jacketed sorbent module containing approximately 40 grams of XAD-2 resin. The XAD-2 resin tube was equipped with an inlet temperature sensor. The XAD-2 resin trap was followed by a condensate knockout impinger and a series of two impingers that contained 100 mL of high purity distilled water. The train also included a second XAD-2 resin trap behind the impinger section to evaluate possible sampling train breakthrough. Each XAD-2 resin trap was connected to a 1-liter condensate knockout trap. The final impinger contained 300 g of dry pre-weighed silica gel. All impingers and the condensate traps were maintained in an ice bath. Ice water was continuously circulated in the condenser and both XAD-2 modules to maintain method-required temperature. A control console with a leakless vacuum pump, a calibrated orifice, and dual inclined manometers was connected to the final impinger via an umbilical cord to complete the sample train.

HFPO Dimer Acid Fluoride (CAS No. 2062-98-8) that is present in the stack gas is expected to be captured in the sampling train along with HFPO Dimer Acid (CAS No. 13252-13-6). HFPO Dimer Acid Fluoride underwent hydrolysis instantaneously in water in the sampling train and during the sample recovery step, and was converted to HFPO Dimer Acid such that the amount of HFPO Dimer Acid emissions represented a combination of both HFPO Dimer Acid Fluoride and HFPO Dimer Acid.

During sampling, gas stream velocities were measured by attaching a calibrated S-type pitot tube into the gas stream adjacent to the sampling nozzle. The velocity pressure differential was observed immediately after positioning the nozzle at each traverse point, and the sampling rate adjusted to maintain isokineticity at 100% ± 10. Flue gas temperature was monitored at each point with a calibrated panel meter and thermocouple. Isokinetic test data was recorded at each traverse point during all test periods, as appropriate. Leak checks were performed on the sampling apparatus according to reference method instructions, prior to and following each run, component change (if required) or during midpoint port changes.

5.2.2 EPA Method 0010 Sample Recovery

At the conclusion of each test, the sampling train was dismantled, the openings sealed, and the components transported to the field laboratory trailer for recovery.

A consistent procedure was employed for sample recovery:

1. The two XAD-2 covered (to minimize light degradation) sorbent modules (1 and 2) were sealed and labeled.

2. The glass fiber filter(s) were removed from the holder with tweezers and placed in a polyethylene container along with any loose particulate and filter fragments.

3. The particulate adhering to the internal surfaces of the nozzle, probe and front half of the filter holder were rinsed with a solution of methanol and ammonium hydroxide into a polyethylene container while brushing a minimum of three times until no visible particulate remains. Particulate adhering to the brush was rinsed with methanol/ ammonium hydroxide into the same container. The container was sealed.

4. The volume of liquid collected in the first condensate trap was measured, the value recorded, and the contents poured into a polyethylene container.

5. All train components between the filter exit and the first condensate trap were rinsed with methanol/ammonium hydroxide. The solvent rinse was placed in a separate polyethylene container and sealed.

6. The volume of liquid in impingers one and two, and the second condensate trap, were measured, the values recorded, and the sample was placed in the same container as Step 4 above, then sealed.

7. The two impingers, condensate trap, and connectors were rinsed with methanol/ ammonium hydroxide. The solvent sample was placed in a separate polyethylene container and sealed.

8. The silica gel in the final impinger was weighed and the weight gain value recorded.

9. Site (reagent) blank samples of the methanol/ammonium hydroxide, XAD resin, filter and distilled water were retained for analysis.

Each container was labeled to clearly identify its contents. The height of the fluid level was marked on the container of each liquid sample to provide a reference point for a leakage check during transport. All samples were maintained cool.

During each test campaign, a Method 0010 blank train was set up near the test location, leak-checked and recovered along with the respective sample train. Following sample recovery, all samples were transported to TestAmerica Laboratories, Inc. (TestAmerica) for sample extraction and analysis.

See Figure 5-2 for a schematic of the Method 0010 sample recovery process.

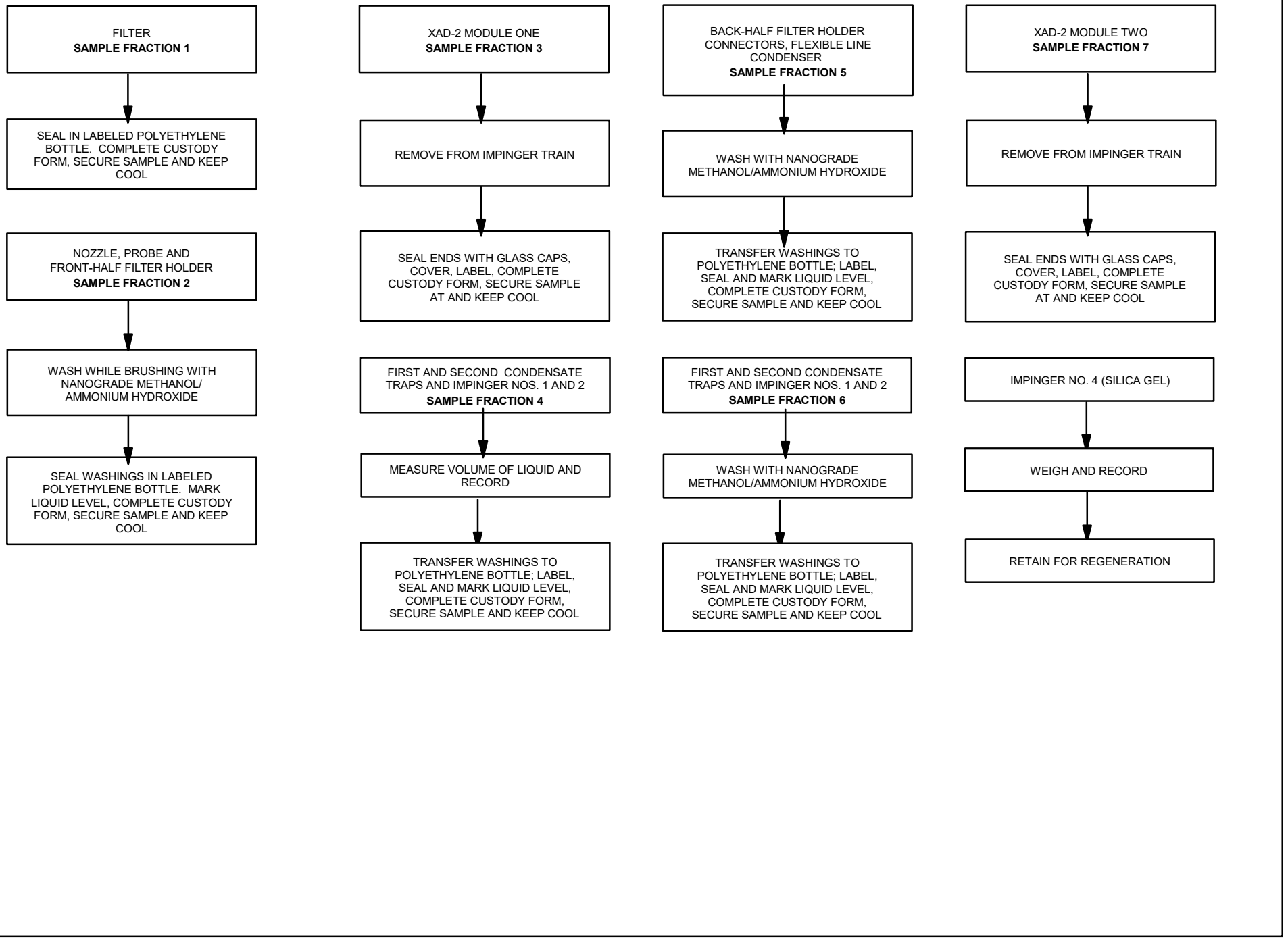


FIGURE 5-2
HFPO DIMER ACID SAMPLE RECOVERY PROCEDURES FOR METHOD 0010

IASDATA\CHEMOURS\15418.002.010\FIGURE 5-2 EPA 0010

5.2.3 EPA Method 0010 Sample Analysis

Method 0010 sampling trains resulted in four separate analytical fractions for HFPO Dimer Acid analysis according to SW-846 Method 3542:

- Front-half Composite—comprised of the particulate filter, and the probe, nozzle, and front-half of the filter holder solvent rinses;
- Back-half Composite—comprised of the first XAD-2 resin material and the back-half of the filter holder with connecting glassware solvent rinses;
- Condensate Composite—comprised of the aqueous condensates and the contents of impingers one and two with solvent rinses;
- Breakthrough XAD-2 Resin Tube—comprised of the resin tube behind the series of impingers.

The second XAD-2 resin material was analyzed separately to evaluate any possible sampling train HFPO-DA breakthrough.

The front-half and back-half composites and the second XAD-2 resin material were placed in polypropylene wide-mouth bottles and tumbled with methanol containing 5% NH_4OH for 18 hours. Portions of the extracts were processed analytically for the HFPO dimer acid by liquid chromatography and duel mass spectroscopy (HPLC/MS/MS). The condensate composite was concentrated onto a solid phase extraction (SPE) cartridge followed by desorption from the cartridge using methanol. Portions of those extracts were also processed analytically by HPLC/MS/MS.

Samples were spiked with isotope dilution internal standard (IDA) at the commencement of their preparation to provide accurate assessments of the analytical recoveries. Final data was corrected for IDA standard recoveries.

TestAmerica developed detailed procedures for the sample extraction and analysis for HFPO Dimer Acid. These procedures were incorporated into the test protocol.

5.3 GAS COMPOSITION

The Weston mobile laboratory equipped with instrumental analyzers was used to measure carbon dioxide (CO_2) and oxygen (O_2) concentrations. A diagram of the Weston sampling system is presented in Figure 5-3.

Each analyzer was set up and calibrated internally by introduction of calibration gas standards directly to the analyzer from a calibration manifold. The calibration manifold is designed with an atmospheric vent to release excess calibration gas and maintained the calibration at ambient pressure. The direct calibration sequence consisted of alternate injections of zero and mid-range gases with appropriate adjustments until the desired responses were obtained. The high-range standards were then introduced in sequence without further adjustment.

The sample line integrity was verified by performing a bias test before and after each test period. The sampling system bias test consisted of introducing the zero gas and one up-range calibration standard in excess to the valve at the probe end when the system was sampling normally. The excess calibration gas flowed out through the probe to maintain ambient sampling system pressure. Calibration gas supply was regulated to maintain constant sampling rate and pressure. Instrument bias check response was compared to internal calibration responses to insure sample line integrity and to calculate a bias correction factor after each run using the ratio of the measured concentration of the bias gas certified by the calibration gas supplier.

The oxygen and carbon dioxide content of each stack gas was measured according to EPA Method 3A procedures which incorporate the latest updates of EPA Method 7E. A Servomex Model 4900 analyzer (or equivalent) was used to measure oxygen content. A Servomex Model 4900 analyzer (or equivalent) was used to measure carbon dioxide content of the stack gas. Both analyzers were calibrated with EPA Protocol gases prior to the start of the test program and performance was verified by sample bias checks before and after each test run.

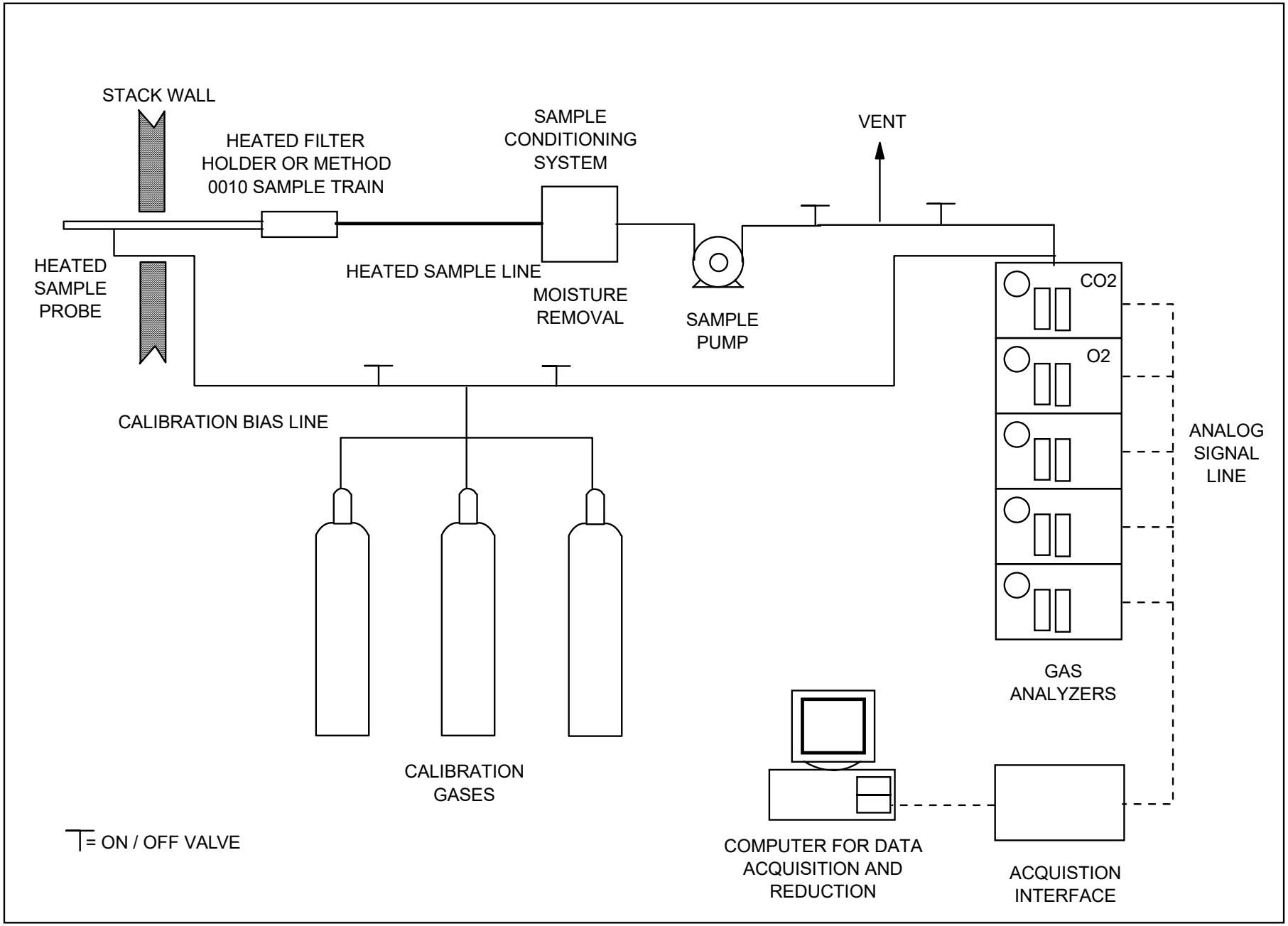


FIGURE 5-3
WESTON SAMPLING SYSTEM

IASDATA\CHEMOURS\15418.002.010\FIGURE 5-3 WESTON SAMPLING SYSTEM2

6. DETAILED TEST RESULTS AND DISCUSSION

Each test was a minimum of 96 minutes in duration. A total of eight test runs were performed at each location.

Tables 6-1 and 6-2 provide detailed test data and test results for the Carbon Bed inlet and the Carbon Bed outlet, respectively.

The Method 3A sampling on all sources indicated that the O_2 and CO_2 concentrations were at ambient air levels (20.9% O_2, 0% CO_2), therefore, 20.9% O_2 and 0% CO_2 values were used in all calculations.

The carbon bed removal efficiency was calculated based upon the HFPO Dimer Acid inlet and outlet mass emission rates in lb/hr.

Seven of the eight runs were >99% efficiency. The one run where the measured efficiency was 80% is being investigated further.

TABLE 6-1
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
CARBON BED INLET

Test Data			
Run number	1	2	3
Location	CBed Inlet	CBed Inlet	CBed Inlet
Date	2/26/2019	2/26/2019	2/27/2019
Time period	0927-1143	1335-1530	0840-1035
SAMPLING DATA:			
Sampling duration, min.	96.0	96.0	96.0
Nozzle diameter, in.	0.215	0.215	0.215
Cross sectional nozzle area, sq.ft.	0.000252	0.000252	0.000252
Barometric pressure, in. Hg	30.29	30.20	30.22
Avg. orifice press. diff., in H_2O	1.33	1.31	1.27
Avg. dry gas meter temp., deg F	58.7	74.0	60.2
Avg. abs. dry gas meter temp., deg. R	519	534	520
Total liquid collected by train, ml	24.7	20.4	28.5
Std. vol. of H_2O vapor coll., cu.ft.	1.2	1.0	1.3
Dry gas meter calibration factor	1.0027	1.0027	1.0027
Sample vol. at meter cond., dcf	52.809	56.260	55.079
Sample vol. at std. cond., dscf [(1)]	54.721	56.462	56.773
Percent of isokinetic sampling	93.9	99.6	100.4
GAS STREAM COMPOSITION DATA:			
CO_2, % by volume, dry basis	0.0	0.0	0.0
O_2, % by volume, dry basis	20.9	20.9	20.9
N_2, % by volume, dry basis	79.1	79.1	79.1
Molecular wt. of dry gas, lb/lb mole	28.84	28.84	28.84
H_20 vapor in gas stream, prop. by vol.	0.021	0.017	0.023
Mole fraction of dry gas	0.979	0.983	0.977
Molecular wt. of wet gas, lb/lb mole	28.61	28.65	28.59
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:			
Static pressure, in. H_2O	-6.50	-6.50	-6.50
Absolute pressure, in. Hg	29.81	29.72	29.74
Avg. temperature, deg. F	69	78	71
Avg. absolute temperature, deg.R	529	538	531
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	24	24	24
Avg. gas stream velocity, ft./sec.	41.3	40.7	40.3
Stack/duct cross sectional area, sq.ft.	6.31	6.31	6.31
Avg. gas stream volumetric flow, wacf/min.	15613	15409	15264
Avg. gas stream volumetric flow, dscf/min.	15187	14774	14739

[(1)] Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 in Hg (760 mm Hg)

TABLE 6-1 (cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
CARBON BED INLET

TEST DATA			
Run number	1	2	3
Location	CBed Inlet	CBed Inlet	CBed Inlet
Date	2/26/2019	2/26/2019	2/27/2019
Time period	0927-1143	1335-1530	0840-1035
CONDITION	**ABR Op.**	**Burnout Run**	**ABR off**
LABORATORY REPORT DATA, ug.			
HFPO Dimer Acid	2713.12	3227.18	1521.59
EMISSION RESULTS, ug/dscm.			
HFPO Dimer Acid	1750.56	2018.04	946.27
EMISSION RESULTS, lb/dscf.			
HFPO Dimer Acid	1.09E-07	1.26E-07	5.91E-08
EMISSION RESULTS, lb/hr.			
HFPO Dimer Acid	9.96E-02	1.12E-01	5.23E-02
EMISSION RESULTS, g/sec.			
HFPO Dimer Acid	1.25E-02	1.41E-02	6.58E-03

TABLE 6-1 (cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
CARBON BED INLET

Test Data			
Run number	4	5	6
Location	CBed Inlet	CBed Inlet	CBed Inlet
Date	2/27/2019	2/28/2019	2/28/2019
Time period	1231-1426	0823-1018	1429-1627
SAMPLING DATA:			
Sampling duration, min.	96.0	96.0	96.0
Nozzle diameter, in.	0.215	0.215	0.215
Cross sectional nozzle area, sq.ft.	0.000252	0.000252	0.000252
Barometric pressure, in. Hg	30.17	29.95	29.95
Avg. orifice press. diff., in H_2O	1.28	1.25	1.28
Avg. dry gas meter temp., deg F	68.8	59.5	70.9
Avg. abs. dry gas meter temp., deg. R	529	519	531
Total liquid collected by train, ml	31.8	28.5	33.1
Std. vol. of H_2O vapor coll., cu.ft.	1.5	1.3	1.6
Dry gas meter calibration factor	1.0027	1.0027	1.0027
Sample vol. at meter cond., dcf	58.052	57.133	58.141
Sample vol. at std. cond., dscf [(1)]	58.762	58.444	58.199
Percent of isokinetic sampling	104.4	104.2	103.9
GAS STREAM COMPOSITION DATA:			
CO_2, % by volume, dry basis	0.0	0.0	0.0
O_2, % by volume, dry basis	20.9	20.9	20.9
N_2, % by volume, dry basis	79.1	79.1	79.1
Molecular wt. of dry gas, lb/lb mole	28.84	28.84	28.84
H_20 vapor in gas stream, prop. by vol.	0.025	0.022	0.026
Mole fraction of dry gas	0.975	0.978	0.974
Molecular wt. of wet gas, lb/lb mole	28.57	28.59	28.55
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:			
Static pressure, in. H_2O	-6.50	-6.50	-6.50
Absolute pressure, in. Hg	29.69	29.47	29.47
Avg. temperature, deg. F	74	70	79
Avg. absolute temperature, deg.R	534	530	539
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	24	24	24
Avg. gas stream velocity, ft./sec.	40.5	40.2	41.1
Stack/duct cross sectional area, sq.ft.	6.31	6.31	6.31
Avg. gas stream volumetric flow, wacf/min.	15335	15222	15534
Avg. gas stream volumetric flow, dscf/min.	14667	14610	14589

[(1)] Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 in Hg (760 mm Hg)

TABLE 6-1 (cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
CARBON BED INLET

TEST DATA			
Run number	4	5	6
Location	CBed Inlet	CBed Inlet	CBed Inlet
Date	2/27/2019	2/28/2019	2/28/2019
Time period	1231-1426	0823-1018	1429-1627
CONDITION	**ABR Op.**	**ABR Op.**	**Burnout Run**
LABORATORY REPORT DATA, ug.			
HFPO Dimer Acid	1711.1700	1540.6200	1702.1090
EMISSION RESULTS, ug/dscm.			
HFPO Dimer Acid	1028.16	930.72	1032.60
EMISSION RESULTS, lb/dscf.			
HFPO Dimer Acid	6.42E-08	5.81E-08	6.45E-08
EMISSION RESULTS, lb/hr.			
HFPO Dimer Acid	5.65E-02	5.09E-02	5.64E-02
EMISSION RESULTS, g/sec.			
HFPO Dimer Acid	7.11E-03	6.41E-03	7.11E-03

TABLE 6-1 (cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
CARBON BED INLET

Test Data		
Run number	7	8
Location	CBed Inlet	CBed Inlet
Date	3/1/2019	3/1/2019
Time period	0813-1008	1237-1433
SAMPLING DATA:		
Sampling duration, min.	96.0	96.0
Nozzle diameter, in.	0.215	0.215
Cross sectional nozzle area, sq.ft.	0.000252	0.000252
Barometric pressure, in. Hg	30.09	30.08
Avg. orifice press. diff., in H_2O	1.29	1.26
Avg. dry gas meter temp., deg F	53.7	61.9
Avg. abs. dry gas meter temp., deg. R	514	522
Total liquid collected by train, ml	28.1	29.5
Std. vol. of H_2O vapor coll., cu.ft.	1.3	1.4
Dry gas meter calibration factor	1.0027	1.0027
Sample vol. at meter cond., dcf	57.793	57.189
Sample vol. at std. cond., dscf [(1)]	60.070	58.483
Percent of isokinetic sampling	104.9	104.7
GAS STREAM COMPOSITION DATA:		
CO_2, % by volume, dry basis	0.0	0.0
O_2, % by volume, dry basis	20.9	20.9
N_2, % by volume, dry basis	79.1	79.1
Molecular wt. of dry gas, lb/lb mole	28.84	28.84
H_20 vapor in gas stream, prop. by vol.	0.022	0.023
Mole fraction of dry gas	0.978	0.977
Molecular wt. of wet gas, lb/lb mole	28.60	28.58
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:		
Static pressure, in. H_2O	-6.50	-6.50
Absolute pressure, in. Hg	29.61	29.60
Avg. temperature, deg. F	64	72
Avg. absolute temperature, deg.R	524	532
Pitot tube coefficient	0.84	0.84
Total number of traverse points	24	24
Avg. gas stream velocity, ft./sec.	40.4	40.1
Stack/duct cross sectional area, sq.ft.	6.31	6.31
Avg. gas stream volumetric flow, wacf/min.	15295	15173
Avg. gas stream volumetric flow, dscf/min.	14917	14557

[(1)] Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 in Hg (760 mm Hg)

TABLE 6-1 (cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULT
CARBON BED INLET

TEST DATA		
Run number	7	8
Location	CBed Inlet	CBed Inlet
Date	3/1/2019	3/1/2019
Time period	0813-1008	1237-1433
CONDITION	**ABR Op.**	**Burnout Run**
LABORATORY REPORT DATA, ug.		
HFPO Dimer Acid	1.44E+03	1.06E+03
EMISSION RESULTS, ug/dscm.		
HFPO Dimer Acid	8.49E+02	6.39E+02
EMISSION RESULTS, lb/dscf.		
HFPO Dimer Acid	5.30E-08	3.99E-08
EMISSION RESULTS, lb/hr.		
HFPO Dimer Acid	4.74E-02	3.49E-02
EMISSION RESULTS, g/sec.		
HFPO Dimer Acid	5.97E-03	4.39E-03

TABLE 6-2
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
CARBON BED OUTLET

Test Data			
Run number	1	2	3
Location	CBed Outlet	CBed Outlet	CBed Outlet
Date	2/26/2019	2/26/2019	2/27/2019
Time period	0927-1143	1335-1530	0840-1035
SAMPLING DATA:			
Sampling duration, min.	96.0	96.0	96.0
Nozzle diameter, in.	0.215	0.215	0.215
Cross sectional nozzle area, sq.ft.	0.000252	0.000252	0.000252
Barometric pressure, in. Hg	30.29	30.20	30.22
Avg. orifice press. diff., in H_2O	1.61	1.65	1.64
Avg. dry gas meter temp., deg F	60.2	79.4	63.3
Avg. abs. dry gas meter temp., deg. R	520	539	523
Total liquid collected by train, ml	17.9	28.3	33.8
Std. vol. of H_2O vapor coll., cu.ft.	0.8	1.3	1.6
Dry gas meter calibration factor	1.0010	1.0010	1.0010
Sample vol. at meter cond., dcf	54.493	55.964	55.596
Sample vol. at std. cond., dscf [(1)]	56.245	55.551	56.924
Percent of isokinetic sampling	95.3	93.6	98.6
GAS STREAM COMPOSITION DATA:			
CO_2, % by volume, dry basis	0.0	0.0	0.0
O_2, % by volume, dry basis	20.9	20.9	20.9
N_2, % by volume, dry basis	79.1	79.1	79.1
Molecular wt. of dry gas, lb/lb mole	28.84	28.84	28.84
H_20 vapor in gas stream, prop. by vol.	0.015	0.023	0.027
Mole fraction of dry gas	0.985	0.977	0.973
Molecular wt. of wet gas, lb/lb mole	28.68	28.58	28.54
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:			
Static pressure, in. H_2O	3.50	3.50	3.50
Absolute pressure, in. Hg	30.55	30.46	30.48
Avg. temperature, deg. F	69	76	78
Avg. absolute temperature, deg.R	529	536	538
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	24	24	24
Avg. gas stream velocity, ft./sec.	40.6	41.7	40.9
Stack/duct cross sectional area, sq.ft.	6.31	6.31	6.31
Avg. gas stream volumetric flow, wacf/min.	15341	15789	15489
Avg. gas stream volumetric flow, dscf/min.	15383	15463	15044

[(1)] Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 in Hg (760 mm Hg)

TABLE 6-2 (cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
CARBON BED OUTLET

TEST DATA			
Run number	1	2	3
Location	CBed Outlet	CBed Outlet	CBed Outlet
Date	2/26/2019	2/26/2019	2/27/2019
Time period	0927-1143	1335-1530	0840-1035
CONDITION	**ABR Op.**	**Burnout Run**	**ABR Off**
LABORATORY REPORT DATA, ug.			
HFPO Dimer Acid	15.1080	4.6752	7.0900
EMISSION RESULTS, ug/dscm.			
HFPO Dimer Acid	9.48	2.97	4.40
EMISSION RESULTS, lb/dscf.			
HFPO Dimer Acid	5.92E-10	1.86E-10	2.75E-10
EMISSION RESULTS, lb/hr.			
HFPO Dimer Acid	5.50E-04	1.70E-04	2.50E-04
HFPO Dimer Acid (From Inlet Data)	9.96E-02	1.12E-01	5.23E-02
EMISSION RESULTS, g/sec.			
HFPO Dimer Acid	6.92E-05	2.14E-05	3.15E-05
Carbon Bed Removal Efficiency, %	99.4	99.8	99.5

TABLE 6-2 (cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
CARBON BED OUTLET

Test Data			
Run number	4	5	6
Location	CBed Outlet	CBed Outlet	CBed Outlet
Date	2/27/2019	2/28/2019	2/27/2019
Time period	1231-1426	0823-1018	1429-1627
SAMPLING DATA:			
Sampling duration, min.	320.1	96.0	1.3
Nozzle diameter, in.	0.215	0.215	0.215
Cross sectional nozzle area, sq.ft.	0.000252	0.000252	0.000252
Barometric pressure, in. Hg	30.17	29.95	29.95
Avg. orifice press. diff., in H_2O	1.63	1.67	1.61
Avg. dry gas meter temp., deg F	71.5	61.4	76.7
Avg. abs. dry gas meter temp., deg. R	532	521	537
Total liquid collected by train, ml	32.8	35.1	39.8
Std. vol. of H_2O vapor coll., cu.ft.	1.5	1.7	1.9
Dry gas meter calibration factor	1.0010	1.0010	1.0010
Sample vol. at meter cond., dcf	56.016	56.152	55.732
Sample vol. at std. cond., dscf [(1)]	56.369	57.190	55.132
Percent of isokinetic sampling	97.8	98.9	97.0
GAS STREAM COMPOSITION DATA:			
CO_2, % by volume, dry basis	0.0	0.0	0.0
O_2, % by volume, dry basis	20.9	20.9	20.9
N_2, % by volume, dry basis	79.1	79.1	79.1
Molecular wt. of dry gas, lb/lb mole	28.84	28.84	28.84
H_20 vapor in gas stream, prop. by vol.	0.027	0.028	0.033
Mole fraction of dry gas	0.973	0.972	0.967
Molecular wt. of wet gas, lb/lb mole	28.55	28.53	28.48
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:			
Static pressure, in. H_2O	3.50	3.50	3.50
Absolute pressure, in. Hg	30.43	30.21	30.21
Avg. temperature, deg. F	82	78	81
Avg. absolute temperature, deg.R	542	538	541
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	24	24	24
Avg. gas stream velocity, ft./sec.	41.2	41.4	41.1
Stack/duct cross sectional area, sq.ft.	6.31	6.31	6.31
Avg. gas stream volumetric flow, wacf/min.	15581	15647	15534
Avg. gas stream volumetric flow, dscf/min.	15022	15065	14807

[(1)] Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 in Hg (760 mm Hg)

TABLE 6-2 (cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
CARBON BED OUTLET

TEST DATA			
Run number	4	5	6
Location	CBed Outlet	CBed Outlet	CBed Outlet
Date	2/27/2019	2/28/2019	2/27/2019
Time period	1231-1426	0823-1018	1429-1627
CONDITION	**ABR Op.**	**ABR Op.**	**Burnout Run**
LABORATORY REPORT DATA, ug.			
HFPO Dimer Acid	320.0500	1.3000	1.9400
EMISSION RESULTS, ug/dscm.			
HFPO Dimer Acid	200.46	0.80	1.24
EMISSION RESULTS, lb/dscf.			
HFPO Dimer Acid	1.25E-08	5.01E-11	7.76E-11
EMISSION RESULTS, lb/hr.			
HFPO Dimer Acid	1.13E-02	5.00E-05	7.00E-05
HFPO Dimer Acid (From Inlet Data)	5.65E-02	5.09E-02	5.64E-02
EMISSION RESULTS, g/sec.			
HFPO Dimer Acid	1.42E-03	6.30E-06	8.81E-06
Carbon Bed Removal Efficiency, %	80.0	99.9	99.9

TABLE 6-2 (cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
CARBON BED OUTLET

Test Data		
Run number	7	8
Location	CBed Outlet	CBed Outlet
Date	3/1/2019	3/1/2019
Time period	0813-1008	1237-1433
SAMPLING DATA:		
Sampling duration, min.	96.0	96.0
Nozzle diameter, in.	0.215	0.215
Cross sectional nozzle area, sq.ft.	0.000252	0.000252
Barometric pressure, in. Hg	30.09	30.08
Avg. orifice press. diff., in H_2O	1.67	1.64
Avg. dry gas meter temp., deg F	56.4	67.1
Avg. abs. dry gas meter temp., deg. R	516	527
Total liquid collected by train, ml	34.2	32.5
Std. vol. of H_2O vapor coll., cu.ft.	1.6	1.5
Dry gas meter calibration factor	1.0010	1.0010
Sample vol. at meter cond., dcf	55.779	55.822
Sample vol. at std. cond., dscf [(1)]	57.623	56.473
Percent of isokinetic sampling	98.6	98.0
GAS STREAM COMPOSITION DATA:		
CO_2, % by volume, dry basis	0.0	0.0
O_2, % by volume, dry basis	20.9	20.9
N_2, % by volume, dry basis	79.1	79.1
Molecular wt. of dry gas, lb/lb mole	28.84	28.84
H_20 vapor in gas stream, prop. by vol.	0.027	0.026
Mole fraction of dry gas	0.973	0.974
Molecular wt. of wet gas, lb/lb mole	28.54	28.55
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:		
Static pressure, in. H_2O	3.50	3.50
Absolute pressure, in. Hg	30.35	30.34
Avg. temperature, deg. F	72	77
Avg. absolute temperature, deg.R	532	537
Pitot tube coefficient	0.84	0.84
Total number of traverse points	24	24
Avg. gas stream velocity, ft./sec.	41.2	40.9
Stack/duct cross sectional area, sq.ft.	6.31	6.31
Avg. gas stream volumetric flow, wacf/min.	15574	15486
Avg. gas stream volumetric flow, dscf/min.	15233	15018

[(1)] Standard conditions = 68 deg. F. (20 deg. C.) and 29.92 in Hg (760 mm Hg)

TABLE 6-2 (cont.)
CHEMOURS - FAYETTEVILLE, NC
SUMMARY OF HFPO DIMER ACID TEST DATA AND TEST RESULTS
CARBON BED OUTLET

TEST DATA		
Run number	7	8
Location	CBed Outlet	CBed Outlet
Date	3/1/2019	3/1/2019
Time period	0813-1008	1237-1433
CONDITION	**ABR Op.**	**Burnout Run**
LABORATORY REPORT DATA, ug.		
HFPO Dimer Acid	1.2200	1.4400
EMISSION RESULTS, ug/dscm.		
HFPO Dimer Acid	0.75	0.90
EMISSION RESULTS, lb/dscf.		
HFPO Dimer Acid	4.67E-11	5.62E-11
EMISSION RESULTS, lb/hr.		
HFPO Dimer Acid	4.00E-05	5.00E-05
HFPO Dimer Acid (From Inlet Data)	4.74E-02	3.49E-02
EMISSION RESULTS, g/sec.		
HFPO Dimer Acid	5.04E-06	6.30E-06
Carbon Bed Removal Efficiency, %	99.9	99.9

APPENDIX A
PROCESS OPERATIONS DATA

Date **2/26/2019**

Time	800	900	1000	1100	1200	1300	1400	1500	1600
Stack Testing		Run 1					Run 2		
HFPO									
VEN Product	PPVE								
VEN Precursor									
VEN Condensation (HFPO)									
VEN ABR							Burnout		
VEN Refining									
Stripper Column Vent									
Division WGS Recirculation Flow	15000 kg/h								
Division WGS Inlet Flow	125 kg/h						105 kg/h	90 kg/h	70 kg/h

Date **2/27/2019**

Time	800	900	1000	1100	1200	1300	1400	1500	1600
Stack Testing		Run 3			Run 4				
HFPO									
VEN Product	PPVE								
VEN Precursor									
VEN Condensation (HFPO)									
VEN ABR									
VEN Refining									
Stripper Column Vent									
Division WGS Recirculation Flow	15000 kg/h								
Division WGS Inlet Flow	75 kg/h		98 kg/h		140 kg/h		125 kg/h	145 kg/h	

Date **2/28/2019**

Time	800		900		1000		1100		1200		1300		1400		1500		1600	
Stack Testing			Run 5											Run 6				
HFPO																		
VEN Product	PPVE																	
VEN Precursor																		
VEN Condensation (HFPO)																		
VEN ABR															Burnout			
VEN Refining																		
Stripper Column Vent																		
Division WGS Recirculation Flow	15000 kg/h																	
Division WGS Inlet Flow	125 kg/h													100 kg/h				

Date **3/1/2019**

Time	800		900		1000		1100		1200		1300		1400		1500		1600	
Stack Testing		Run 7								Run 8								
HFPO																		
VEN Product	PPVE																	
VEN Precursor																		
VEN Condensation (HFPO)																		
VEN ABR											Burnout							
VEN Refining																		
Stripper Column Vent																		
Division WGS Recirculation Flow	15000 kg/h																	
Division WGS Inlet Flow	120 kg/h										80 kg/h				60 kg/h			

APPENDIX B
RAW AND REDUCED TEST DATA

CHEMOURS - FAYETTEVILLE, NC
INPUTS FOR HFPO DIMER ACID CALCULATIONS
CARBON BED INLET

Test Data			
Run number	1	2	3
Location	CBed Inlet	CBed Inlet	CBed Inlet
Date	2/26/2019	2/26/2019	2/27/2019
Time period	0927-1143	1335-1530	0840-1035
Operator	RS/JL	RS/JL	RS/JL
Inputs For Calcs.			
Sq. rt. delta P	0.72952	0.71386	0.71111
Delta H	1.3292	1.3125	1.2667
Stack temp. (deg.F)	69.4	77.7	70.8
Meter temp. (deg.F)	58.7	74.0	60.2
Sample volume (act.)	52.809	56.260	55.079
Barometric press. (in.Hg)	30.29	30.20	30.22
Volume H_2O imp. (ml)	13.5	6.4	10.6
Weight change sil. gel (g)	11.2	14.0	17.9
% CO_2	0.0	0.0	0.0
% O_2	20.9	20.9	20.9
% N_2	79.1	79.1	79.1
Area of stack (sq.ft.)	6.305	6.305	6.305
Sample time (min.)	96.0	96.0	96.0
Static pressure (in.H_2O)	-6.50	-6.50	-6.50
Nozzle dia. (in.)	0.215	0.215	0.215
Meter box cal.	1.0027	1.0027	1.0027
Cp of pitot tube	0.84	0.84	0.84
Traverse points	24	24	24

CHEMOURS - FAYETTEVILLE, NC
INPUTS FOR HFPO DIMER ACID CALCULATIONS
CARBON BED INLET

Test Data			
Run number	4	5	6
Location	CBed Inlet	CBed Inlet	CBed Inlet
Date	2/27/2019	2/28/2019	2/28/2019
Time period	1231-1426	0823-1018	1429-1627
Operator	RS/JL/JD	RS/JL	RS/JL
Inputs For Calcs.			
Sq. rt. delta P	0.71144	0.70689	0.71440
Delta H	1.2792	1.2542	1.2750
Stack temp. (deg.F)	74.0	69.5	79.1
Meter temp. (deg.F)	68.8	59.5	70.9
Sample volume (act.)	58.052	57.133	58.141
Barometric press. (in.Hg)	30.17	29.95	29.95
Volume H_2O imp. (ml)	14.0	12.0	13.8
Weight change sil. gel (g)	17.8	16.5	19.3
% CO_2	0.0	0.0	0.0
% O_2	20.9	20.9	20.9
% N_2	79.1	79.1	79.1
Area of stack (sq.ft.)	6.305	6.305	6.305
Sample time (min.)	96.0	96.0	96.0
Static pressure (in.H_2O)	-6.50	-6.50	-6.50
Nozzle dia. (in.)	0.215	0.215	0.215
Meter box cal.	1.0027	1.0027	1.0027
Cp of pitot tube	0.84	0.84	0.84
Traverse points	24	24	24

CHEMOURS - FAYETTEVILLE, NC
INPUTS FOR HFPO DIMER ACID CALCULATIONS
CARBON BED INLET

Test Data		
Run number	7	8
Location	CBed Inlet	CBed Inlet
Date	3/1/2019	3/1/2019
Time period	0813-1008	1237-1433
Operator	RS/JL	RS/JL
Inputs For Calcs.		
Sq. rt. delta P	0.71577	0.70463
Delta H	1.2917	1.2583
Stack temp. (deg.F)	64.0	71.7
Meter temp. (deg.F)	53.7	61.9
Sample volume (act.)	57.793	57.189
Barometric press. (in.Hg)	30.09	30.08
Volume H_2O imp. (ml)	10.7	11.6
Weight change sil. gel (g)	17.4	17.9
% CO_2	0.0	0.0
% O_2	20.9	20.9
% N_2	79.1	79.1
Area of stack (sq.ft.)	6.305	6.305
Sample time (min.)	96.0	96.0
Static pressure (in.H_2O)	-6.50	-6.50
Nozzle dia. (in.)	0.215	0.215
Meter box cal.	1.0027	1.0027
Cp of pitot tube	0.84	0.84
Traverse points	24	24

INLET

Sample and Velocity Traverse Point Data Sheet - Method 1

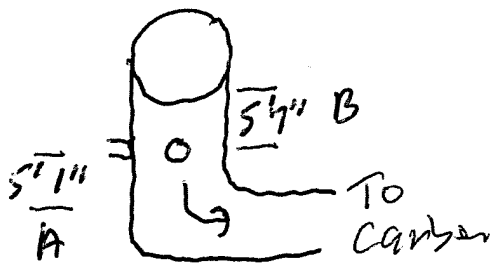
Client Chemours
Loaction/Plant Fayetteville NC
Source VE North Carbon Inlet
Operator AS
Date 6-13-18
W.O. Number

Duct Type	☒ Circular	☐ Rectangular Duct	Indicate appropriate type	
Traverse Type	☑ Particulate Traverse	☐ Velocity Traverse		☐ CEM Traverse

Distance from far wall to outside of port (in.) = C	54 5/4"
Port Depth (in.) = D	20 5/8"
Depth of Duct, diameter (in.) = C-D	34"
Area of Duct (ft^2)	6.305
Total Traverse Points	24
Total Traverse Points per Port	12
Port Diameter (in.) ---(Flange-Threaded-Hole)	
Monorail Length	
Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	
Equivalent Diameter = (2*L*W)/(L+W)	

Flow Disturbances	
Upstream - A (ft)	5' 7"
Downstream - B (ft)	5' 1"
Upstream - A (duct diameters)	1.97
Downstream - B (duct diameters)	1.80

Diagram of Stack



Traverse Point Locations

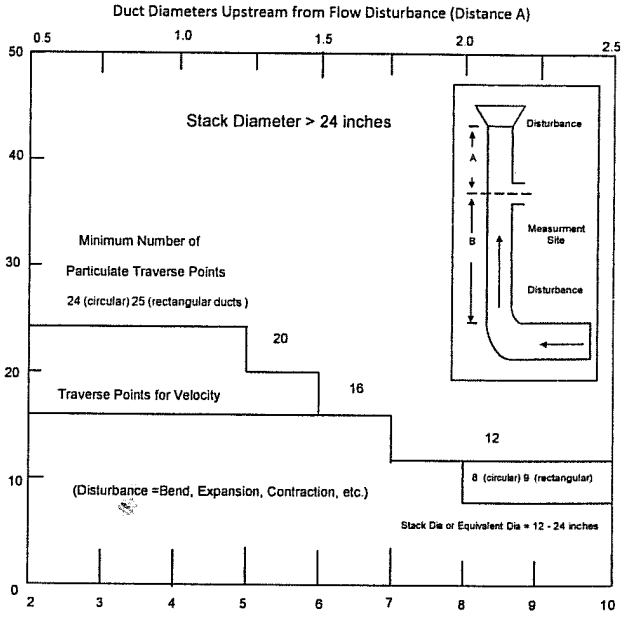
Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	.021	3/4	21 3/8
2	.067	2 1/4	22 7/8
3	.118	4	24 5/8
4	.177	6	26 5/8
5	.250	8 1/2	29 1/8
6	.356	12 1/8	32 3/4
7	.644	21 7/8	42 1/2
8	.750	25 1/2	46 1/8
9	.823	28	48 5/8
10	.882	30	50 5/8
11	.933	31 3/4	52 3/8
12	.979	33 1/4	53 7/8

CEM 3 Point(Long Measurment Line) Stratificaton Point Locations

1	0.167		
2	0.50		
3	0.833		

Note: If stack dia < 12 inch use EPA Method 1A
(Sample port upstream of pitot port)
Note: If stack dia >24" then adjust traverse point to 1 inch from wall
If stack dia <24" then adjust traverse point to 0.5 inch from wall

Duct Diameters Upstream from Flow Disturbance (Distance A)



Duct Diameters Downstream from Flow Disturbance (Distance B)

Traverse Point Location Percent of Stack -Circular

Traverse Point	Number of Traverse Points 1	2	3	4	5	6	7	8	9	10	11	12
1		14.6		6.7		4.4		3.2		2.6		2.1
2		85.4		25		14.6		10.5		8.2		6.7
3				75		29.6		19.4		14.6		11.8
4				93.3		70.4		32.3		22.6		17.7
5						85.4		67.7		34.2		25
6						95.6		80.6		65.8		35.6
7								89.5		77.4		64.4
8								96.8		85.4		75
9										91.8		82.3
10										97.4		88.2
11												93.3
12												97.9

Traverse Point Location Percent of Stack -Rectangular

Traverse Point	Number of Traverse Points 1	2	3	4	5	6	7	8	9	10	11	12
1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
7							92.9	81.3	72.2	65.0	59.1	54.2
8								93.8	83.3	75.0	68.2	62.5
9									94.4	85.0	77.3	70.8
10										95.0	86.4	79.2
11											95.5	87.5
12												95.8

WESTON MANAGERS DESIGNERS/CONSULTANTS

A1- starting points B1 B

CB Inlet 2.5

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

Client	Chemours
W.O.#	15418
Project ID	Chemours
Mode/Source ID	Carbon Bed
Samp. Loc. ID	IN
Run No.ID	1
Test Method ID	M0010
Date ID	25FEB2019
Source/Location	VE North Inlet
Sample Date	2-26-2019 ✓
Baro. Press (in Hg)	30.29 ✓
Operator	RS / JL ✓

Stack Conditions

	Assumed	Actual
% Moisture	2	
Impinger Vol (ml)		
Silica gel (g)		
CO2, % by Vol		0 ✓
O2, % by Vol		20.9 ✓
Temperature (°F)	50	
Meter Temp (°F)	50	
Static Press (in H_2O)	-6.5	-6.5 ✓
Ambient Temp (°F)	55	

Meter Box ID	28		
Meter Box Y	1.0027 ✓		
Meter Box Del H	2.0895		
Probe ID / Length	P694 / P710		
Probe Material	Boro		
Pitot / Thermocouple ID	P694 / P710		
Pitot Coefficient	0.84 ✓		
Nozzle ID	.215		
Nozzle Measurements	.215	.215	.215
Avg Nozzle Dia (in)	.215 ✓		
Area of Stack (ft²)	6.305 ✓		
Sample Time	96 ✓		
Total Traverse Pts	24 ✓		

K Factor 2.5

	Initial	Mid-Point	Final
Sample Train (ft³)	0.007	0.004	0.012
Leak Check @ (in Hg)	15"	6"	17"
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
~~Method 3 System good~~	~~yes / no~~	~~yes / no~~	~~yes / no~~

Temp Check	Pre-Test Set	Post-Test Set
Meter Box Temp		
Reference Temp		
Pass/Fail (+/- 2°)	Pass / Fail	Pass / Fail
Temp Change Response ?	yes / no	yes / no

TRAVERSE POINT	NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
		0	9:27 ✓			335.~~965~~ .990 RS									
A	1	4		.40	1.0	338.0	68	52	120	120	46	4	47		
	2	8		.45	1.1	340.1	68	52	120	121	45	4	48		
	3	12		.46	1.1	342.2	68	53	119	122	43	4	48		
	4	16		.44	1.1	344.3	68	53	121	121	44	4.5	48		
	5	20		.49	1.2	346.6	68	54	120	120	44	4.5	48		
	6	24		.47	1.2	349.0	68	54	120	121	45	4.5	49		
	7	28		.54	1.3	351.1	67	55	120	120	45	4.5	49	A =	27,938
	8	32		.60	1.5	353.5	67	56	120	119	45	5	49		
	9	36		.67	1.7	356.1	67	56	120	121	45	5.5	50		
	10	40		.67	1.7	358.9	67	57	120	120	46	5.5	50		
	11	44		.65	1.6	361.4	67	58	120	119	47	5.5	51		
	12	48	10:15	.66	1.6	363.928	68	59	120	119	47	5.5	51		
															% Iso
B	1	4	10:55	.54	1.3	366.4	69	61	121	121	53	5	54	99.1	
	2	8		.51	1.3	368.8	70	61	120	122	51	5	54		% M
	3	12		.50	1.3	371.0	70	61	121	122	50	5	55	1.9	
	4	16		.48	1.2	373.3	71	61	119	120	49	5	55		
	5	20		.46	1.1	375.4	71	61	120	121	50	4.5	55		
	6	24		.49	1.2	377.6	71	62	120	120	50	4.5	55	1.370 Vw	
	7	28		.59	1.5	380.0	72	62	121	121	51	5	55		
	8	32		.60	1.5	382.5	72	63	120	119	51	5	56	67.3	
	9	36		.60	1.5	385.1	72	63	120	120	52	5	57		
	10	40		.57	1.4	387.5	72	64	119	119	52	5	57		
	11	44		.53	1.3	389.8	72	65	120	120	53	5	57		
	12	48	11:43 ✓	.47	1.2	392.010	72	66	120	119	53	4.5	57		~~28,002~~

Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max
.5350 ✓	1.3291 ✓	55.809 ✓	69.375 ✓	58.7083 ✓	119/120	119/122	53	5.5	47/57

Avg Sqrt Delta P	Avg Sqrt Del H
.7295 ✓	1.1497 ✓

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

Comments: DGM start = 335.990 ✓

DGM After mid point leak = 364.004 ✓ → 364.139 ✓

* 364.139 - 363.928 = .211 *

~~28,006~~

27,871

B =

✓ and Both probes 694/710 recovered.

P694 used on port A = too long for B used 710 for B

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

Client	Chemours
W.O.#	15418
Project ID	Chemours
Mode/Source ID	Carbon Bed
Samp. Loc. ID	IN
Run No.ID	2
Test Method ID	M0010
Date ID	2625FEB2019
Source/Location	VE North Inlet
Sample Date	2-26-2019 ✓
Baro. Press (in Hg)	30.20 ✓
Operator	RS / JL ✓

Stack Conditions	Assumed	Actual
% Moisture	2	
Impinger Vol (ml)		
Silica gel (g)		
CO2, % by Vol	0	✓
O2, % by Vol	20.9	✓
Temperature (°F)	70	
Meter Temp (°F)	75	
Static Press (in H_2O)	-6.5	-6.5 ✓
Ambient Temp (°F)	65°	

Meter Box ID	28
Meter Box Y	1.0027 ✓
Meter Box Del H	2.0845
Probe ID / Length	P710
Probe Material	Boro
Pitot / Thermocouple ID	P710
Pitot Coefficient	0.84 ✓
Nozzle ID	.215
Nozzle Measurements	.215 / .215 / .215
Avg Nozzle Dia (in)	.215 ✓
Area of Stack (ft^2)	6.305 ✓
Sample Time	96 ✓
Total Traverse Pts	24 ✓

K Factor 2.57

	Initial	Mid-Point	Final
Sample Train (ft^3)	0.009	0.205	0.004
Leak Check @ (in Hg)	15"	7"	7"
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
Method 3 System good	yes / no	yes / no	yes / no
Temp Check	Pre-Test Set		Post-Test Set
Meter Box Temp			
Reference Temp			
Pass/Fail (+/- 2°)	Pass / Fail		Pass / Fail
Temp Change Response ?	yes / no		yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	13:35 ✓			392.340									
A 1	4		.44	1.1	394.5	80	71	121	120	61	4	62		
2	8		.45	1.1	396.7	80	71	120	120	56	4	62		
3	12		.47	1.2	398.9	79	71	119	121	52	4	61		
4	16		.47	1.2	401.2	78	71	120	120	50	4	55		
5	20		.47	1.2	403.5	77	71	120	119	49	4	54		
6	24		.48	1.2	405.6	77	72	120	121	49	4	54		
7	28		.51	1.3	408.1	77	72	120	120	49	4.5	54		28,195
8	32		.53	1.4	410.4	77	73	120	120	49	4.5	54		
9	36		.59	1.5	412.9	76	73	119	120	49	4.5	54		
10	40		.60	1.5	415.3	76	73	120	121	49	4.5	54		
11	44		.62	1.6	418.0	76	74	120	120	49	5	54		
12	48	14:23	.63	1.6	420.535	77	74	120	120	49	5	53		
B 1	4	14:42	.50	1.3	423.0	77	75	120	121	53	4	55		99.5 E
2	8		.49	1.3	425.4	77	75	119	120	53	4	55		
3	12		.48	1.2	427.5	78	75	121	121	50	4	54		
4	16		.46	1.2	429.9	78	75	121	120	50	4	53		1,65
5	20		.44	1.1	432.0	78	75	119	120	51	4	53		14800
6	24		.47	1.2	434.3	78	76	120	121	51	4	54		
7	28		.58	1.5	436.8	78	76	120	119	52	4.5	54		56,47
8	32		.57	1.5	439.3	78	76	120	122	52	4.5	55		Vm
9	36		.57	1.5	441.8	78	76	119	120	51	4.5	54		
10	40		.53	1.4	444.3	78	76	121	119	51	4.5	55		
11	44		.47	1.2	446.5	78	77	120	121	52	4	55		
12	48	15:30 ✓	.45	1.2	448.729	78	77	119	120	52	4	55		28,065
			Avg Delta P .5112 ✓	Avg Delta H 1.3125 ✓	Total Volume 56.260 ✓	Avg Ts ~~77.9083~~	Avg Tm 73.958 ✓	Min/Max 119/121	Min/Max 119/122	Max 61	Max Vac 5	Min/Max 53/62		
			Avg Sqrt Delta P .7138 ✓	Avg Sqrt Del H 1.1435 ✓	Comments: midpoint / leak check = 420.535 → 420.664									EPA Method 0010 from EPA SW-846

WESTON SOLUTIONS

.7138 ✓ and

.7138 6

77.67

* = .129 * Port B 3 pt

CB Inlet

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

Client	Chemours
W.O.#	15418
Project ID	Chemours
Mode/Source ID	Carbon Bed
Samp. Loc. ID	IN
Run No.ID	3
Test Method ID	M0010
Date ID	27 28FEB2019
Source/Location	VE North Inlet
Sample Date	2-27-2019 ✓
Baro. Press (in Hg)	30.22 ✓
Operator	RS / JL ✓

Stack Conditions	Assumed	Actual
% Moisture	2	
Impinger Vol (ml)		
Silica gel (g)		
CO2, % by Vol	0	✓
O2, % by Vol	20.9	✓
Temperature (°F)	70	
Meter Temp (°F)	60	
Static Press (in H_2O)	-6.5	-6.5 ✓
Ambient Temp (°F)	51°	

Meter Box ID	28
Meter Box Y	1.0027
Meter Box Del H	2.0895
Probe ID / Length	P710
Probe Material	Boro
Pitot / Thermocouple ID	P710
Pitot Coefficient	0.84 ✓
Nozzle ID	.215
Nozzle Measurements	.215 / .215 / .215
Avg Nozzle Dia (in)	.215 ✓
Area of Stack (ft^2)	6.305 ✓
Sample Time	96 ✓
Total Traverse Pts	24 ✓

Sample Train (ft^3)	
Leak Check @ (in Hg)	
Pitot leak check good	yes / no
Pitot Inspection good	yes / no
Method 3 System good	N/A yes / no
Temp Check	
Meter Box Temp	
Reference Temp	
Pass/Fail (+/- 2°)	Pass / Fail
Temp Change Response ?	yes / no

K Factor 2.5

	Initial	Mid-Point	Final
	0.004	0.008	0.009
	15"	7"	7"
	yes / no	yes / no	yes / no
	yes / no	yes / no	yes / no
	yes / no	yes / no	yes / no

Temp Check	Pre-Test Set	Post-Test Set
Meter Box Temp	54	68
Reference Temp	54.5	68.2
Pass/Fail (+/- 2°)	Pass / Fail	Pass / Fail
Temp Change Response ?	yes / no	yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	8:40 ✓			449.414									
A 1	4		.42	1.0	451.4	68	54	119	118	52	4.5	42		
2	8		.42	1.0	453.4	68	54	119	119	52	4.5	42		
3	12		.47	1.2	455.7	68	54	120	121	48	4.5	42		
4	16		.49	1.2	457.9	68	54	120	120	47	4.5	42		
5	20		.47	1.2	460.0	68	55	120	121	48	4.5	41		
6	24		.47	1.2	462.3	69	56	120	121	47	4.5	42		27.382
7	28		.52	1.3	464.6	69	56	121	119	48	5	43		
8	32		.48	1.2	466.9	69	57	120	119	48	5	44		
9	36		.58	1.4	469.3	69	58	121	121	49	5	45		
10	40		.62	1.5	471.8	69	58	120	120	49	5.5	45		
11	44		.62	1.5	474.3	69	59	119	119	50	5.5	46		
12	48	9:28	.63	1.6	476.796	69	59	120	121	51	5.5	46		
B 1	4	9:47	.48	1.2	479.3	71	61	120	119	54	5	48		
2	8		.47	1.2	481.6	72	62	120	120	54	5	50		
3	12		.47	1.2	483.8	72	62	120	121	53	5	50		
4	16		.45	1.1	486.0	73	63	121	119	54	5	50		
5	20		.45	1.1	488.1	73	63	120	120	56	5	51		27.01
6	24		.46	1.2	490.4	74	64	120	121	58	5	51		27.697
7	28		.56	1.4	492.8	74	64	121	119	59	5.5	52		
8	32		.57	1.4	495.2	74	65	120	120	59	5.5	44		
9	36		.56	1.4	497.5	74	66	119	120	59	5.5	42		
10	40		.54	1.4	500.0	73	66	121	119	58	5.5	41		
11	44		.52	1.3	502.4	73	67	120	120	56	5.5	40		
12	48	10:35 ✓	.46	1.2	504.766	73	67	119	120	55	5.5	41		
			Avg Delta P ✓ .5075	Avg Delta H ✓ 1.2666	Total Volume ✓ 55.079	Avg Ts ✓ 70.791	Avg Tm ✓ 60.1666	Min/Max 119/121	Min/Max 118/121	Max 59	Max Vac 5.5	Min/Max 41/52		
			Avg Sqrt Delta P ✓ .711106	Avg Sqrt Del H ✓ 1.1234	Comments: ✓✓ Midpoint leak check DGM = 476.796 → 477.069									

39 * .273 *

EPA Method 0010 from EPA SW-846

100.4 ±30
2.3% M
1474
56.77 V

CB ~~Outlet~~ Inlet

SAMPLE RECOVERY FIELD DATA

EPA Method 0010 - HFPO Dimer Acid

Client: Chemours | W.O. #: 15418
Location/Plant: Fayetteville, NC | Source & Location: VE North Inlet

Run No. 1 FR 320 230 | Sample Date 2/26/19 | Recovery Date 2/26/19
Sample I.D. Chemours - Carbon Bed - IN - 1 - M0010 - | Analyst JM2/MS | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H2O	HPLC H2O		-1	-2			Silica Gel	
Final	2	100	100	0	303.6	320.2			311.2	
Initial	0	100	100	0	307	300.2			300	
Gain	2	0	0	0	292.1	0		13.2	11.2	24.7

Impinger Color: all clear | 11.5 | Labeled? ✓ | 11.3 ✓ 13.5 ✓
Silica Gel Condition: blue 90% | Sealed? ✓

Run No. 2 FR 320 230 B0 | Sample Date 2/26/19 | Recovery Date 2/26/19
Sample I.D. Chemours - Carbon Bed - IN - 2 - M0010 - | Analyst JM2/MS | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H2O	HPLC H2O		#1	#2			Silica Gel	
Final	4	100	100		309.8	319.9			314	
Initial	0	100	100		307.4	319.9			300	
Gain	4	0	0		2.4	0		6.4 ✓	14 ✓	20.4

Impinger Color: all clear | Labeled? ✓
Silica Gel Condition: blue 90% | Sealed? ✓

Run No. 3 FR 230 | Sample Date 2/27/19 | Recovery Date 2/27/19
Sample I.D. Chemours - Carbon Bed - IN - 3 - M0010 - | Analyst JM2/MS | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H2O	HPLC H2O						Silica Gel	
Final	6	100	100		297.1	306.1			317.9	
Initial	0	100	100		292.5	306.7			300	
Gain	6	0	0		4.6	0		10.6 ✓	17.9	28.5

Impinger Color: all clear | Labeled? ✓
Silica Gel Condition: blue 90% | Sealed? ✓

Check COC for Sample IDs of Media Blanks

	Balance Cal weight	Actual	
2/26/19	500.	499.8	✓
2/27/19	500.	499.6	✓

CB Inlet

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

Page 1 of 1

		Stack Conditions	Assumed	Actual				
Client	Chemours				Meter Box ID	28		
W.O.#	15418				Meter Box Y	1.0027 ✓		
Project ID	Chemours	% Moisture	2		Meter Box Del H	2.0895		
Mode/Source ID	Carbon Bed	Impinger Vol (ml)			Probe ID / Length	P710		Sample Train (ft³)
Samp. Loc. ID	IN	Silica gel (g)			Probe Material	Boro		Leak Check @ (in Hg)
Run No.ID	4	CO2, % by Vol	0	✓	Pitot / Thermocouple ID	P710		Pitot leak check good
Test Method ID	M0010	O2, % by Vol	20.9	✓	Pitot Coefficient	0.84 ✓		Pitot Inspection good
Date ID	27-28FEB2019	Temperature (°F)	70		Nozzle ID	.215		Method 3 System good
Source/Location	VE North Inlet	Meter Temp (°F)	70		Nozzle Measurements	.215	.215	.215
Sample Date	2-27-2019 ✓	Static Press (in H_2O)	-6.5	-6.5 ✓	Avg Nozzle Dia (in)	.215 ✓		
Baro. Press (in Hg)	30.17 ✓				Area of Stack (ft²)	6.305 ✓		
Operator	RS / JL / JD ✓	Ambient Temp (°F)	62°		Sample Time	96 ✓		Pass/Fail (+/- 2°)
					Total Traverse Pts	24 ✓		Temp Change Response ?

K Factor 2.54

	Initial	Mid-Point	Final
Sample Train (ft³)	0.014	0.024	0.005
Leak Check @ (in Hg)	15"	6"	5"
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
Method 3 System good	N/A yes / no	yes / no	yes / no
Temp Check	Pre-Test Set		Post-Test Set
Meter Box Temp	62		72
Reference Temp	61.1		71.5
Pass/Fail (+/- 2°)	Pass / Fail		Pass / Fail
Temp Change Response ?	yes / no		yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	12:31 ✓			506.584									
A 1	4		.43	1.1	508.9	70	65	119	121	58	4	56		
2	8		.45	1.1	511.1	72	65	119	120	57	4	42		
3	12		.47	1.2	513.4	72	65	120	121	54	4	42		
4	16		.45	1.1	515.7	73	65	120	120	53	4	40		
5	20		.47	1.2	518.1	73	66	119	121	53	4	40		
6	24		.48	1.2	520.4	74	66	120	121	53	4	40		29.176
7	28		.46	1.2	522.7	74	67	121	120	53	4	42		
8	32		.54	1.4	521.4	74	67	121	120	53	4.5	42		
9	36		.55	1.4	527.7	74	68	120	121	53	4.5	43		
10	40		.61	1.5	530.4	74	68	120	120	53	45	44		
11	44		.65	1.6	533.1	74	69	120	119	54	4.5	43		104.4
12	48	13:19	.65	1.6	535.760	74	69	121	119	54	4.5	42		
														2.19 %/m
B 1	4	13:38	.48	1.2	538.2	73	70	119	120	54	4	42		
2	8		.47	1.2	540.6	75	70	120	119	54	4	42		14700
3	12		.46	1.2	543.0	75	70	120	120	52	4	38		
4	16		.44	1.1	545.2	75	70	120	120	50	4	37		58.8
5	20		.42	1.1	547.5	75	70	121	119	50	4	37		
6	24		.45	1.1	549.8	75	70	119	120	50	4	38		20,876
7	28		.57	1.4	552.2	75	70	120	120	50	5	38		
8	32		.57	1.4	554.8	75	71	121	121	50	5	39		
9	36		.58	1.5	557.4	75	71	120	119	50	5	39		
10	40		.56	1.4	559.9	75	71	119	120	50	5	39		
11	44		.53	1.3	562.4	75	71	120	121	51	5	40		
12	48	14:26 ✓	.46	1.2	564.750	75	72	121	120	52	5	40		
			Avg Delta P .5083 ✓	Avg Delta H 1.2791 ✓	Total Volume 58.052 ✓	Avg Ts 74.0 ✓	Avg Tm 68.5833 ✓	Min/Max 119/121	Min/Max 119/121	Max 58	Max Vac 5	Min/Max 37/56		
			Avg Sqrt Delta P .71143 ✓	Avg Sqrt Del H 1.1288 ✓										

WESTON SOLUTIONS

Comments: ✓

Mid point leak check
DGM = 535.760 → 535.874
* = 41.114 *

EPA Method 0010 from EPA SW-846

✓ and ✓

CB Inlet

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

		Stack Conditions	Assumed	Actual				
Client	Chemours				Meter Box ID	28		
W.O.#	15418				Meter Box Y	1.0027 ✓		
Project ID	Chemours	% Moisture	2		Meter Box Del H	2.0895		
Mode/Source ID	Carbon Bed	Impinger Vol (ml)			Probe ID / Length	P710		Sample Train (ft^3)
Samp. Loc. ID	IN	Silica gel (g)			Probe Material	Boro		Leak Check @ (In Hg)
Run No.ID	5	CO2, % by Vol	0	✓	Pitot / Thermocouple ID	P710		Pitot leak check good
Test Method ID	M0010	O2, % by Vol	20.9	✓	Pitot Coefficient	0.84 ✓		Pitot Inspection good
Date ID	28 28FEB2019	Temperature (°F)	60		Nozzle ID	.215		Method 3 System good
Source/Location	VE North Inlet	Meter Temp (°F)	60		Nozzle Measurements	.215 / .215 / .215		**Temp Check**
Sample Date	2-28-2019 ✓	Static Press (In H_2O)	-6.5	-6.5 ✓	Avg Nozzle Dia (in)	.215 ✓		Meter Box Temp
Baro. Press (in Hg)	29.95 ✓				Area of Stack (ft^2)	6.305 ✓		Reference Temp
Operator	BS / JL ✓	Ambient Temp (°F)	53°		Sample TIme	96 ✓		Pass/Fail (+/- 2°)
					Total Traverse Pts	24 ✓		Temp Change Response ?

K Factor 2.5

	Initial	Mid-Point	Final
Sample Train (ft^3)	0.015	0.013	0.014
Leak Check @ (In Hg)	15"	7"	6"
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
Method 3 System good	N/A yes / no	yes / no	yes / no
Temp Check	Pre-Test Set		Post-Test Set
Meter Box Temp	54		65
Reference Temp	55.1		65.7
Pass/Fail (+/- 2°)	Pass / Fail		Pass / Fail
Temp Change Response ?	yes / no		yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	8:23 ✓			565.160									
A 1	4		.42	1.1	567.4	67	54	120	120	54	4	39		
2	8		.45	1.1	569.6	68	54	120	121	52	4	37		
3	12		.45	1.1	571.9	68	54	121	120	49	4	38		
4	16		.47	1.2	574.2	69	55	120	119	48	4.5	36		
5	20		.47	1.2	576.6	69	55	119	119	47	4.5	35		
6	24		.48	1.2	578.8	69	56	120	121	47	4.5	35		
7	28		.50	1.2	581.1	69	56	121	120	47	4.5	35		28.62
8	32		.52	1.3	583.7	69	57	120	121	47	4.5	35		
9	36		.56	1.4	586.0	69	57	120	120	46	5	35		
10	40		.57	1.4	588.6	69	58	119	120	46	5	36		
11	44		.61	1.5	591.2	69	59	121	120	46	5	35		
12	48	9:11	.61	1.5	593.780	69	59	121	120	47	5	36		
B 1	4	9:30	.48	1.2	596.2	69	61	119	120	52	4.5	39		
2	8		.47	1.2	598.6	70	61	119	119	48	4.5	37		
3	12		.45	1.1	600.8	70	62	120	121	47	4.5	37		28,513
4	16		.44	1.1	603.1	70	62	120	120	46	4.5	37		
5	20		.43	1.1	605.3	70	62	119	120	48	4.5	37		
6	24		.44	1.1	607.6	70	62	120	121	47	4.5	37		
7	28		.55	1.4	610.1	70	63	121	119	48	5	40		
8	32		.56	1.4	612.5	71	63	120	121	48	5	38		104.2 F
9	36		.57	1.4	615.1	71	64	119	121	48	5	39		14610
10	40		.54	1.4	617.6	71	64	120	120	49	5	38		
11	44		.52	1.3	620.1	71	64	120	121	50	5	39		2175
12	48	10:18 ✓	.47	1.2	622.429	71	65	120	119	50	5	40		58.4
			Avg Delta P .5012 ✓	Avg Delta H 1.2541 ✓	Total Volume 57.133 ✓	Avg Ts 69.5 ✓	Avg Tm 59.4583 ✓	Min/Max 119/121	Min/Max 119/121	Max 54	Max Vac 5	Min/Max 35/40		
			Avg Sqrt Delta P .706888 ✓	Avg Sqrt Del H 1.1182 ✓	Comments: ✓✓									

WESTON SOLUTIONS ✓ mmd

midpoint leak check
DGM = 593.780 → 593.916
* .136 *

EPA Method 0010 from EPA SW-846

CB INLET

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

Page 1 of 1

		Stack Conditions	Assumed	Actual						K Factor 2.5	Initial	Mid-Point	Final
Client	Chemours				Meter Box ID	28							
W.O.#	15418				Meter Box Y	1.0027 ✓							
Project ID	Chemours	% Moisture	2		Meter Box Del H	2.0895							
Mode/Source ID	Carbon Bed	Impinger Vol (ml)			Probe ID / Length	P710				Sample Train (ft^3)	0.010	0.007	0.016
Samp. Loc. ID	IN	Silica gel (g)			Probe Material	Boro				Leak Check @ (in Hg)	15"	6"	7"
Run No.ID	6	CO2, % by Vol	0	✓	Pitot / Thermocouple ID	P710				Pitot leak check good	(yes) / no	(yes) / no	(yes) / no
Test Method ID	M0010	O2, % by Vol	20.9	✓	Pitot Coefficient	0.84 ✓				Pitot Inspection good	(yes) / no	(yes) / no	(yes) / no
Date ID	28~~28~~FEB2019	Temperature (°F)	~~80~~		Nozzle ID	.215				Method 3 System good	N/A yes / no	~~yes~~ / no	~~yes~~ / no
Source/Location	VE North Inlet	Meter Temp (°F)	75		Nozzle Measurements	.215	.215	.215		**Temp Check**	Pre-Test Set		Post-Test Set
Sample Date	2-28-2019 ✓	Static Press (in H_2O)	-6.5	-6.5 ✓	Avg Nozzle Dia (in)	.215				Meter Box Temp	69		71
Baro. Press (in Hg)	29.95 ✓				Area of Stack (ft^2)	6.305 ✓				Reference Temp	68.8		71.4
Operator	RS / JL ✓	Ambient Temp (°F)	68°		Sample Time	96 ✓				Pass/Fail (+/- 2°)	(Pass) / Fail		(Pass) / Fail
					Total Traverse Pts	24 ✓				Temp Change Response ?	yes / no		yes / no

TRAVERSE POINT	NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
		0	14:29 ✓			624.373									
A	1	4		.43	1.1	626.7	80	70	120	121	60	5	49		
	2	8		.45	1.1	629.0	80	70	120	120	60	5	49		
	3	12		.47	1.2	631.3	80	70	121	119	58	5	44		
	4	16		.47	1.2	633.7	80	70	120	120	57	5	43		
	5	20		.48	1.2	636.1	79	70	119	121	58	5	42		
	6	24		.49	1.2	638.4	79	71	121	119	56	5	43		
	7	28		.52	1.3	640.9	79	71	121	120	55	5.5	44		
	8	32		.53	1.3	643.3	79	71	120	121	54	5.5	44		29.491
	9	36		.55	1.4	645.9	79	71	119	119	54	6	44		
	10	40		.60	1.5	648.5	79	71	120	121	54	6	44		
	11	44		.63	1.6	651.1	79	72	121	119	54	6	44		
	12	48	15:17	.63	1.6	653.864	79	72	120	120	54	6	44		
B	1	4	15:39	.50	1.2	656.3	78	71	121	119	60	6	45		
	2	8		.47	1.2	658.7	79	71	121	119	60	6	45		
	3	12		.45	1.1	660.9	79	71	119	120	58	5.5	42		
	4	16		.44	1.1	663.2	79	71	119	119	58	5	39		
	5	20		.44	1.1	665.4	79	71	119	120	58	5	43		
	6	24		.46	1.1	667.7	79	71	121	121	58	5	41		28.65
	7	28		.57	1.4	670.3	79	71	120	119	57	6	40		
	8	32		.58	1.4	672.7	79	71	119	119	56	6	41		
	9	36		.57	1.4	675.3	79	71	120	120	56	6	40		
	10	40		.56	1.4	677.8	79	71	120	119	57	6	40		
	11	44		.52	1.3	680.3	79	71	120	120	57	6	41		
	12	48	16:27 ✓	.48	1.2	682.635	79	71	120	120	57	6	41		103.971
				Avg Delta P ✓ .5120	Avg Delta H ✓ 1.275	Total Volume ✓ 58.141	Avg Ts ✓ 79.125	Avg Tm ✓ 70.875	Min/Max 119/121	Min/Max 119/121	Max 60	Max Vac 7	Min/Max 39/49		2.6 m
				Avg Sqrt Delta P ✓ .714395	Avg Sqrt Del H ✓ 1.1271	Comments: ✓✓	midpoint leak check								14600
							DGM = 653.864 → 653.985								58.14
							* .121 *								

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

CB Inlet

SAMPLE RECOVERY FIELD DATA

EPA Method 0010 - HFPO Dimer Acid

Client: Chemours | W.O. #: 15418
Location/Plant: Fayetteville, NC | Source & Location: VE North Inlet

Run No. 4 | Sample Date 2/27/19 | Recovery Date 2/27/19
Sample I.D. Chemours - Carbon Bed - IN - 4 - M0010 - | Analyst JDO/MS | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	8	100	100	0		305.7	306.4		317.8	
Initial	0	100	100	0		302.7	306.8		300	
Gain	8	0	0	0		6	0	14 ✓	17.8 ✓	31.8

Impinger Color: all clear | Labeled? ✓
Silica Gel Condition: Ice 90% | Sealed? ✓

Run No. 5 | Sample Date 2/28/19 | Recovery Date 2/28/19
Sample I.D. Chemours - Carbon Bed - IN - 5 - M0010 - | Analyst JDO/MS | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	5	100	100	0		299.7	306.7		316.5	
Initial	0	100	100	0		292.7	307.4		300	
Gain	5	0	0	0		7	0	17 ✓	16.5 ✓	28.5

Impinger Color: all clear | Labeled? ✓
Silica Gel Condition: Ice 95% | Sealed? ✓

Run No. 6 FR 150 BO | Sample Date 2/28/19 | Recovery Date 2/28/19
Sample I.D. Chemours - Carbon Bed - IN - 6 - M0010 - | Analyst JDO/MS | Filter Number NA

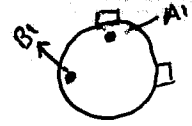
	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	8	100	100	0		312.5	303.8		319.3	
Initial	0	100	100	0		306.7	303.9		300	
Gain	8	0	0	0		5.8	0	13.8 ✓	19.3 ✓	33.1

Impinger Color: all clear | Labeled? ✓
Silica Gel Condition: Ice 90% | Sealed? ✓

Check COC for Sample IDs of Media Blanks

Balance
2/28/19 | weight 500.0 | recv'd 499.8 ✓

WESTON SOLUTIONS



CB Inlet

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

Client	Chemours
W.O.#	15418
Project ID	Chemours
Mode/Source ID	Carbon Bed
Samp. Loc. ID	IN
Run No.ID	7
Test Method ID	M0010
Date ID	~~25FEB~~2019
Source/Location	VE North Inlet
Sample Date	3-1-2019 J
Baro. Press (in Hg)	30.09 √
Operator	RS / SL J

Stack Conditions	Assumed	Actual
% Moisture	2	
Impinger Vol (ml)		
Silica gel (g)		
CO2, % by Vol	0	
O2, % by Vol	20.9	
Temperature (°F)	65	
Meter Temp (°F)	55	
Static Press (in H_2O)	-6.5	-6.5 √
Ambient Temp (°F)	47°	

Meter Box ID	28
Meter Box Y	1.0027 √
Meter Box Del H	2.0895
Probe ID / Length	P710
Probe Material	Boro
Pitot / Thermocouple ID	P71
Pitot Coefficient	0.84 √
Nozzle ID	.215
Nozzle Measurements	.215 / .215 / .215
Avg Nozzle Dia (in)	.215 √
Area of Stack (ft^2)	6.305 √
Sample Time	96 √
Total Traverse Pts	24 √

Sample Train (ft^3)	
Leak Check @ (in Hg)	
Pitot leak check good	
Pitot Inspection good	
Method 3 System good	N/A yes / ~~no~~
Temp Check	
Meter Box Temp	
Reference Temp	
Pass/Fail (+/- 2°)	
Temp Change Response ?	

K Factor 2.5

	Initial	Mid-Point	Final
	0.010	0.014	0.009
	15"	6"	5"
	(yes) / no	(yes) / no	(yes) / no
	(yes) / no	(yes) / no	(yes) / no
	(yes) / no	(yes) / no	(yes) / no
	Pre-Test Set		Post-Test Set
	48		52
	48.7		51.4
	(Pass) / Fail		(Pass) / Fail
	yes / no		yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	8:13			683.505									
A 1	4		.43	1.1	685.8	61	49	120	120	49	4	40		
2	8		.45	1.1	688.0	62	50	120	121	48	4	39		
3	12		.45	1.1	690.2	63	50	120	119	47	4	38		
4	16		.47	1.2	692.5	63	50	120	121	46	4	38		
5	20		.47	1.2	694.9	64	51	121	121	46	4	38		
6	24		.50	1.2	697.2	64	51	119	120	46	4	39		
7	28		.50	1.2	699.6	64	51	119	120	46	4	38		29.075
8	32		.53	1.3	702.0	64	52	119	120	45	4	39		
9	36		.59	1.5	704.6	64	53	121	120	46	4	39		
10	40		.62	1.6	707.3	64	53	120	120	46	4.5	40		
11	44		.62	1.6	710.0	64	54	121	120	46	4.5	40		
12	48	9:01	.62	1.6	712.580	64	54	119	120	48	4.5	41		
B 1	4	9:20	.48	1.2	715.1	63	55	119	120	49	4	44		
2	8		.47	1.2	717.4	64	55	119	121	49	4	40		
3	12		.47	1.2	719.7	64	55	119	120	46	4	38		
4	16		.45	1.1	721.9	65	55	121	120	46	4	38		28.718
5	20		.45	1.1	724.2	65	55	121	120	46	4	38		
6	24		.46	1.2	726.6	65	55	119	120	47	4	38		
7	28		.60	1.5	729.2	65	56	119	120	47	4.5	39		
8	32		.58	1.5	731.6	65	56	120	121	46	4.5	38		104.4 ↓
9	36		.57	1.4	734.2	65	57	121	120	47	4.5	38		
10	40		.55	1.4	736.7	65	57	119	120	48	4.5	39		2.2 MM
11	44		.53	1.3	739.1	65	57	119	119	48	4.5	40		14910
12	48	10:08	.48	1.2	741.437	65	57	119	120	48	4.5	40		60.07
			Avg Delta P .5141 √	Avg Delta H 1.2916 √	Total Volume 57.793 √	Avg Ts 64.04 √	Avg Tm 53.66 √	Min/Max 119/121	Min/Max 119/121	Max 49	Max Vac 4.5	Min/Max 38/44		
			Avg Sqrt Delta P .71577	Avg Sqrt Del H 1.1341 √	Comments:									

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

√ mm

//

midpoint leak check

PGM = 712.580 → 712.719

* .139 *

CB Inlet

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

Page 1 of 1

Client	Chemours
W.O.#	15418
Project ID	Chemours
Mode/Source ID	Carbon Bed
Samp. Loc. ID	IN
Run No.ID	8
Test Method ID	M0010
Date ID	~~25FEB2019~~
Source/Location	VE North Inlet
Sample Date	3-1-2019
Baro. Press (in Hg)	30.08
Operator	RS / JL / KA

Stack Conditions

	Assumed	Actual
% Moisture	2	
Impinger Vol (ml)		
Silica gel (g)		
CO2, % by Vol	0	✓
O2, % by Vol	20.9	✓
Temperature (°F)		
Meter Temp (°F)		
Static Press (in H_2O)	-6.5	-6.5 ✓
Ambient Temp (°F)	52	

Meter Box ID	28
Meter Box Y	1.0027 ✓
Meter Box Del H	2.0895
Probe ID / Length	P710
Probe Material	Boro
Pitot / Thermocouple ID	P710
Pitot Coefficient	0.84 ✓
Nozzle ID	.215
Nozzle Measurements	.215 / .215 / .215
Avg Nozzle Dia (in)	.215 ✓
Area of Stack (ft^2)	6.305 ✓
Sample Time	96 ✓
Total Traverse Pts	24 ✓

K Factor 25

	Initial	Mid-Point	Final
Sample Train (ft^3)	0.019	0.010	0.010
Leak Check @ (in Hg)	15"	7"	6"
Pitot leak check good	(yes) / no	(yes) / no	(yes) / no
Pitot Inspection good	(yes) / no	(yes) / no	(yes) / no
Method 3 System good	N/A yes / no	~~yes~~ / no	~~yes~~ / no
Temp Check	Pre-Test Set		Post-Test Set
Meter Box Temp	61		67
Reference Temp	61.2		66.6
Pass/Fail (+/- 2°)	(Pass) / Fail		(Pass) / Fail
Temp Change Response ?	yes / no		yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	12:37			741.740									
A 1	4		.41	1.0	744.0	68	57	121	120	56	4.5	52		
2	8		.41	1.0	745.5	69	57	121	119	55	4.5	45		
3	12		.43	1.1	748.2	70	55	121	121	55	5	44		
4	16		.45	1.1	750.4	70	57	120	122	54	5	42		
5	20		.45	1.1	752.6	71	58	120	120	53	4.5	42		
6	24		.47	1.2	755.0	71	58	119	121	54	5	43		
7	28		.50	1.3	757.4	71	59	120	119	53	5	44		
8	32		.53	1.3	759.9	71	60	120	120	52	5	44		
9	36		.57	1.4	762.4	71	60	120	121	52	5	44		
10	40		.63	1.6	765.0	71	61	120	119	52	5	44		
11	44		.63	1.6	767.7	71	61	120	120	52	5	45		
12	48	13:25	.63	1.6	770.419	71	62	120	119	53	5	46		
B 1	4	13:45	.46	1.2	772.9	72	64	120	120	57	5	48		
2	8		.47	1.2	775.2	73	64	120	120	55	5	45		
3	12		.45	1.1	777.5	73	64	119	119	54	5	44		
4	16		.45	1.1	779.7	73	64	119	121	54	5	44		
5	20		.42	1.1	781.9	73	64	121	120	53	5	42		
6	24		.45	1.1	784.1	73	64	121	119	53	5	44		
7	28		.55	1.4	787.5	73	65	120	120	53	5	45		
8	32		.55	1.4	789.2	73	65	121	120	54	5	44		
9	36		.55	1.4	791.6	73	66	120	120	54	5.5	44		
10	40		~~.55~~ ~~.50~~ .50	~~1.4~~ ~~1.4~~ 1.3	~~793~~ ~~794~~ 794.2	73	66	120	119	55	5.5	45		
11	44		.50	1.3	796.7	73	67	120	120	55	5.5	46		
12	48	14:33	.46	1.2	799.051	73	67 ✓	119	121	55	5.5	46		
			Avg Delta P .4987 ✓	Avg Delta H 1.2583 ✓	Total Volume 57.189 ✓	Avg Ts 71.66 ✓	Avg Tm 61.875 ✓	Min/Max 119/121	Min/Max 119/121	Max 57	Max Vac 5.5	Min/Max 42/52		
			Avg Sqrt Delta P .7046 ✓	Avg Sqrt Del H 1.1189 ✓										

Comments: mid point leak check

DGM = 770.419 → 770.541

* 46 . 122 *

EPA Method 0010 from EPA SW-846

✓ mm

CB Inlet

SAMPLE RECOVERY FIELD DATA

EPA Method 0010 - HFPO Dimer Acid

Client: Chemours | W.O. #: 15418
Location/Plant: Fayetteville, NC | Source & Location: VE North Inlet

Run No. 7 | Sample Date 3/1/19 | Recovery Date 3/1/19
Sample I.D. Chemours - Carbon Bed - IN - 7 - M0010 - | Analyst JDO / MS | Filter Number NA

	Impinger 1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	6	100	100	0		311.8	306.4		317.4	
Initial	0	100	100	0		307.1	306.9		300	
Gain	6	0	0	0		4.7	0	10.7	17.4	28.1

Impinger Color: all clear | Labeled? ✓ | ✓ ✓
Silica Gel Condition: ~~blue 100%~~ | Sealed? ✓

Run No. 8 | Sample Date 3/1/19 | Recovery Date 3/1/19
Sample I.D. Chemours - Carbon Bed - IN - 8 - M0010 - | Analyst JDO / MS | Filter Number NA

	Impinger 1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	6	100	100	0		301.2	299.4		317.9	
Initial	0	100	100	0		295.6	300.2		300	
Gain	6	0	0	0		5.6	0	11.6	17.9	

Impinger Color: all clear | Labeled? ✓ | ✓ ✓
Silica Gel Condition: blue 95% | Sealed? ✓

Run No. ___ | Sample Date ___ | Recovery Date ___
Sample I.D. Chemours - Carbon Bed - IN - 0 - M0010 - | Analyst ___ | Filter Number ___

	Impinger 1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final										
Initial		100	100						300	
Gain										

Impinger Color ___ | Labeled? ___
Silica Gel Condition ___ | Sealed? ___

Check COC for Sample IDs of Media Blanks

SAMPLE RECOVERY FIELD DATA

Client: Chemours | W.O. #: Fayetteville NC
Location/Plant: CD Inlet | Source & Location: VE NT Carbon Bed

Run No. BT | Sample Date 3/1/19 | Recovery Date 3/1/19
Sample I.D. _____ | Analyst JMO | Filter Number WA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents									Silica Gel	
Final	0	100	100			299.5	306.1		300	
Initial	0	100	100			299.6	306.1		300	
Gain	0	0	0			0	0	0	0	

Impinger Color: all clear | Labeled? ✓
Silica Gel Condition: blue 100% | Sealed? ✓

Run No. ___ | Sample Date _____ | Recovery Date _____
Sample I.D. _____ | Analyst _____ | Filter Number _____

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents									Silica Gel	
Final										
Initial										
Gain										

Impinger Color _____ | Labeled? _____
Silica Gel Condition _____ | Sealed? _____

Run No. ___ | Sample Date _____ | Recovery Date _____
Sample I.D. _____ | Analyst _____ | Filter Number _____

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents									Silica Gel	
Final										
Initial										
Gain										

Impinger Color _____ | Labeled? _____
Silica Gel Condition _____ | Sealed? _____

Check COC for Sample IDs of Media Blanks

CHEMOURS - FAYETTEVILLE, NC
INPUTS FOR HFPO DIMER ACID CALCULATIONS
CARBON BED OUTLET

Test Data			
Run number	1	2	3
Location	CBed Outlet	CBed Outlet	CBed Outlet
Date	2/26/2019	2/26/2019	2/27/2019
Time period	0927-1143	1335-1530	0840-1035
Operator	KA/AS	KA/AS	KA/AS
Inputs For Calcs.			
Sq. rt. delta P	0.72636	0.74086	0.72467
Delta H	1.6079	1.6463	1.6433
Stack temp. (deg.F)	69.5	75.8	78.5
Meter temp. (deg.F)	60.2	79.4	63.3
Sample volume (act.)	54.493	55.964	55.596
Barometric press. (in.Hg)	30.29	30.20	30.22
Volume H_2O imp. (ml)	2.9	10.1	10.6
Weight change sil. gel (g)	15.0	18.2	23.2
% CO_2	0.0	0.0	0.0
% O_2	20.9	20.9	20.9
% N_2	79.1	79.1	79.1
Area of stack (sq.ft.)	6.305	6.305	6.305
Sample time (min.)	96.0	96.0	96.0
Static pressure (in.H_2O)	3.50	3.50	3.50
Nozzle dia. (in.)	0.215	0.215	0.215
Meter box cal.	1.0010	1.0010	1.0010
Cp of pitot tube	0.84	0.84	0.84
Traverse points	24	24	24

CHEMOURS - FAYETTEVILLE, NC
INPUTS FOR HFPO DIMER ACID CALCULATIONS
CARBON BED OUTLET

Test Data			
Run number	4	5	6
Location	CBed Outlet	CBed Outlet	CBed Outlet
Date	2/27/2019	2/28/2019	2/27/2019
Time period	1231-1426	0823-1018	1429-1627
Operator	KA/AS/JO	KA/AS/JO	KA/AS/JO
Inputs For Calcs.			
Sq. rt. delta P	0.72615	0.72908	0.72133
Delta H	1.6338	1.6721	1.6075
Stack temp. (deg.F)	81.8	77.9	80.6
Meter temp. (deg.F)	71.5	61.4	76.7
Sample volume (act.)	56.016	56.152	55.732
Barometric press. (in.Hg)	30.17	29.95	29.95
Volume H_2O imp. (ml)	10.3	14.1	17.8
Weight change sil. gel (g)	22.5	21.0	22.0
% CO_2	0.0	0.0	0.0
% O_2	20.9	20.9	20.9
% N_2	79.1	79.1	79.1
Area of stack (sq.ft.)	6.305	6.305	6.305
Sample time (min.)	96.0	96.0	96.0
Static pressure (in.H_2O)	3.50	3.50	3.50
Nozzle dia. (in.)	0.215	0.215	0.215
Meter box cal.	1.0010	1.0010	1.0010
Cp of pitot tube	0.84	0.84	0.84
Traverse points	24	24	24

CHEMOURS - FAYETTEVILLE, NC
INPUTS FOR HFPO DIMER ACID CALCULATIONS
CARBON BED OUTLET

Test Data		
Run number	7	8
Location	CBed Outlet	CBed Outlet
Date	3/1/2019	3/1/2019
Time period	0813-1008	1237-1433
Operator	KA/AS/JO	KA/RS/JO/AS
Inputs For Calcs.		
Sq. rt. delta P	0.73119	0.72378
Delta H	1.6713	1.6425
Stack temp. (deg.F)	72.4	77.3
Meter temp. (deg.F)	56.4	67.1
Sample volume (act.)	55.779	55.822
Barometric press. (in.Hg)	30.09	30.08
Volume H_2O imp. (ml)	16.8	12.8
Weight change sil. gel (g)	17.4	19.7
% CO_2	0.0	0.0
% O_2	20.9	20.9
% N_2	79.1	79.1
Area of stack (sq.ft.)	6.305	6.305
Sample time (min.)	96.0	96.0
Static pressure (in.H_2O)	3.50	3.50
Nozzle dia. (in.)	0.215	0.215
Meter box cal.	1.0010	1.0010
Cp of pitot tube	0.84	0.84
Traverse points	24	24

OUTLET

Sample and Velocity Traverse Point Data Sheet - Method 1

Client Chemours | Operator BG
Loaction/Plant Fayetteville NC | Date 6/13/18
Source VE North Carbon Outlet | W.O. Number

Duct Type	☒ Circular	☐ Rectangular Duct	Indicate appropriate type	
Traverse Type	☒ Particulate Traverse	☐ Velocity Traverse		☐ CEM Traverse

Distance from far wall to outside of port (in.) = C	54 5/8
Port Depth (in.) = D	20 5/8
Depth of Duct, diameter (in.) = C-D	34
Area of Duct (ft²)	6.305
Total Traverse Points	24
Total Traverse Points per Port	12
Port Diameter (in.) ---(Flange-Threaded-Hole)	
Monorail Length	
Rectangular Ducts Only	
Width of Duct, rectangular duct only (in.)	
Total Ports (rectangular duct only)	
Equivalent Diameter = (2*L*W)/(L+W)	

Traverse Point Locations

Traverse Point	% of Duct	Distance from Inside Duct Wall (in)	Distance from Outside of Port (in)
1	.021	3/4	21 3/8
2	.067	2 1/4	22 7/8
3	.118	4	24 5/8
4	.177	6	26 5/8
5	.250	8 1/2	29 1/8
6	.356	12 1/8	32 3/4
7	.644	21 5/8	42 1/2
8	.75	25 1/2	46 1/8
9	.823	28	48 5/8
10	.882	30	50 5/8
11	.933	31 3/4	52 3/8
12	.979	33 1/4	53 7/8

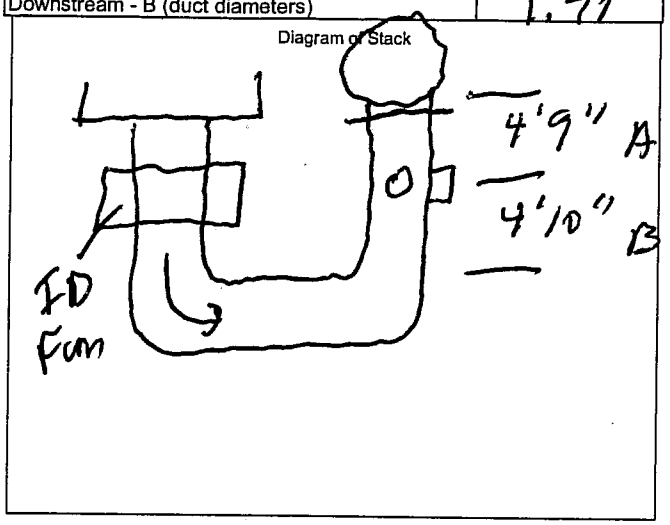
CEM 3 Point(Long Measurment Line) Stratificaton Point Locations

1	0.167		
2	0.50		
3	0.833		

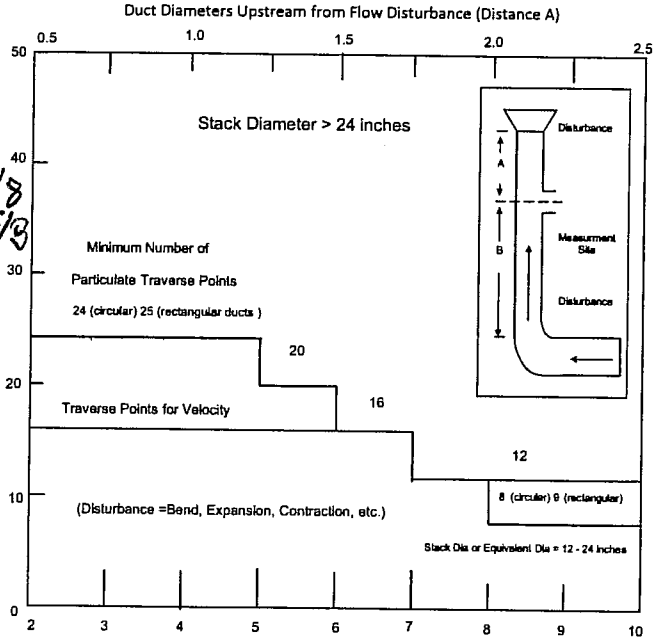
Note: If stack dia < 12 inch use EPA Method 1A
(Sample port upstream of pitot port)
Note: If stack dia >24" then adjust traverse point to 1 inch from wall
If stack dia <24" then adjust traverse point to 0.5 inch from wall

Flow Disturbances	
Upstream - A (ft)	4' 4"
Downstream - B (ft)	4' 10"
Upstream - A (duct diameters)	1.53
Downstream - B (duct diameters)	1.71

Diagram of Stack



Duct Diameters Upstream from Flow Disturbance (Distance A)



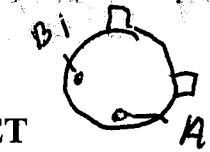
Duct Diameters Downstream from Flow Disturbance (Distance B)

Traverse Point Location Percent of Stack -Circular

Traverse Point Location	Number of Traverse Points												
		1	2	3	4	5	6	7	8	9	10	11	12
	1		14.6		6.7		4.4		3.2		2.6		2.1
	2		85.4		25		14.6		10.5		8.2		6.7
	3				75		29.6		19.4		14.6		11.8
	4				93.3		70.4		32.3		22.6		17.7
	5						85.4		67.7		34.2		25
	6						95.6		80.6		65.8		35.6
	7								89.5		77.4		64.4
	8								96.8		85.4		75
	9										91.8		82.3
	10										97.4		88.2
	11												93.3
	12												97.9

Traverse Point Location Percent of Stack -Rectangular

Traverse Point Location	Number of Traverse Points												
		1	2	3	4	5	6	7	8	9	10	11	12
	1		25.0	16.7	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2
	2		75.0	50.0	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5
	3			83.3	62.5	50.0	41.7	35.7	31.3	27.8	25.0	22.7	20.8
	4				87.5	70.0	58.3	50.0	43.8	38.9	35.0	31.8	29.2
	5					90.0	75.0	64.3	56.3	50.0	45.0	40.9	37.5
	6						91.7	78.6	68.8	61.1	55.0	50.0	45.8
	7							92.9	81.3	72.2	65.0	59.1	54.2
	8								93.8	83.3	75.0	68.2	62.5
	9									94.4	85.0	77.3	70.8
	10										95.0	86.4	79.2
	11											95.5	87.5
	12												95.8



= CB OAK

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

		Stack Conditions	
Client	Chemours		
W.O.#	15418.002.000 v02.010KA	Assumed	Actual
Project ID	Chemours	% Moisture	4
Mode/Source ID	Carbon Bed	Impinger Vol (ml)	
Samp. Loc. ID	OUT	Silica gel (g)	
Run No.ID	1	CO2, % by Vol	0.0 ✓
Test Method ID	M0010	O2, % by Vol	20.9 ✓
Date ID	KA 26 ~~25~~FEB2019	Temperature (°F)	73
Source/Location	VE North Outlet	Meter Temp (°F)	50
Sample Date	2/26/19 ✓	Static Press (in H_2O)	3.5 ✓
Baro. Press (in Hg)	30.24 ✓		
Operator	KA/AS ✓	Ambient Temp (°F)	39

Meter Box ID	22		
Meter Box Y	1.6010 ✓		
Meter Box Del H	2.4674		
Probe ID / Length	P706	6'	Sample Train (ft³)
Probe Material	Boro		Leak Check @ (in Hg)
Pitot / Thermocouple ID	P706		Pitot leak check good
Pitot Coefficient	0.84 ✓		Pitot Inspection good
Nozzle ID	.215		Method 3 System go
Nozzle Measurements	.215	.215 / .215	**Temp Check**
Avg Nozzle Dia (in)	.215 ✓		Meter Box Temp
Area of Stack (ft²)	6.365 ✓		Reference Temp
Sample Time	96 ✓		Pass/Fail (+/- 2°)
Total Traverse Pts	24 ✓		Temp Change Response ?

K Factor 2.8 2.9

	Initial	Mid-Point	Final
Sample Train (ft³)	0.005	0.010	0.012
Leak Check @ (in Hg)	15"	7"	15"
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
Method 3 System go	yes / no	yes / no	yes / no
Temp Check	Pre-Test Set		Post-Test Set
Meter Box Temp			
Reference Temp			
Pass/Fail (+/- 2°)	Pass / Fail		Pass / Fail
Temp Change Response ?	yes / no		yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	0927 ✓			648.394									
A 1	4		.54	1.6	650.6	67	48	126	126	47	5	45		
2	8		~~.54~~ .57 KA	~~1.6~~ 1.7 KA	653.0	67	51	125	125	41	5	36		
3	12		.57	1.7	655.2	67	52	125	127	43	6	37		
4	16		.49	1.4	657.5	68	53	126	126	46	5	37		
5	20		.50	1.5	659.7	68	54	126	126	48	5	37		
6	24		.51	1.5	661.9	68	54	126	126	49	5	37		
7	28		.52	1.5	664.1	68	56	126	126	50	5	37		
8	32		.49	1.4	666.2	68	56	126	126	51	5	39	A=	26,113
9	36		.46	1.3	668.3	68	57	126	126	51	5	39		
10	40		.44	1.3	670.4	68	58	126	126	51	5	39		
11	44		.42	1.2	672.5	69	59	126	126	51	4	40		
12	48	1015	.42	1.2	674.507	69	59	120	126	52	4	41		
										56 KA		~~51~~ 51 KA		M4Pb, + LC
B 1	4	1055	.25	.73	676.3	70	63	126	125	56	3	51		674.663
2	8		.27	.78	677.9	70	63	125	125	52	3	41		(0.156)
3	12		.28	.81	679.6	70	64	126	126	52	3	42		
4	16		.30	.87	681.3	70	64	125	125	52	3	42		95.4 %
5	20		.35	1.0	683.2	71	65	125	125	53	4	42		
6	24		.40	1.2	685.2	71	65	125	125	54	4	41		1.5 % M
7	28		.75	2.2	688.0	71	66	126	126	55	7	41		
8	32		.88	2.6	690.9	71	66	125	125	56	8	42		15400
9	36		.92	2.7	693.9	72	67	125	125	58	8	41		
10	40		.95	2.8	697.0	72	67	126	126	59	9	42		56.2 Vm
11	44		.95	2.8	700.0	72	69	126	126	61	9	44		
12	48	1143 ✓	.95	2.8	703.043	72	69	126	126	61	9	44		
			Avg Delta P .549 ✓	Avg Delta H 1.608 ✓	Total Volume 54.493 ✓	Avg Ts 69.5 ✓	Avg Tm 60.208 ✓	Min/Max 125/126	Min/Max 125/126	Max 61	Max Vac 9	Min/Max 36/51	B=	28,38
			Avg Sqrt Delta P .720 ✓	Avg Sqrt Del H 1.242 ✓	Comments:									

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

✓ and .72636 ✓✓

CB Outlet

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

Page 1 of 1

		Stack Conditions	
Client	Chemours	Assumed	Actual
W.O.#	15418		
Project ID	Chemours	% Moisture	
Mode/Source ID	Carbon Bed	Impinger Vol (ml)	
Samp. Loc. ID	OUT	Silica gel (g)	
Run No.ID	2	CO2, % by Vol	0.0 ✓
Test Method ID	M0010	O2, % by Vol	20.9 ✓
Date ID	25FEB2019	Temperature (°F)	77 / 75.75
Source/Location	VE North Outlet	Meter Temp (°F)	69 / 74.375
Sample Date	26 Feb 19 ✓	Static Press (in H_2O)	3.5 ✓
Baro. Press (in Hg)	~~30.24~~ 30.20 KAV	Ambient Temp (°F)	67
Operator	KA/AS ✓		

Meter Box ID	22		Sample Train (ft^3)	0.003 / 0.005 / 0.016
Meter Box Y	1.0010 ✓		Leak Check @ (in Hg)	15" / 7" / 12"
Meter Box Del H	2.4674		Pitot leak check good	yes / no / yes / no / yes / no
Probe ID / Length	P706	6'	Pitot Inspection good	yes / no / yes / no / yes / no
Probe Material		Boro	Method 3 System g	yes / no / yes / no / yes / no
Pitot / Thermocouple ID	P706		**Temp Check**	Pre-Test Set / Post-Test Set
Pitot Coefficient		0.84 ✓	Meter Box Temp	
Nozzle ID	.215		Reference Temp	
Nozzle Measurements	.215 / .215 / .215		Pass/Fail (+/- 2°)	Pass / Fail / Pass / Fail
Avg Nozzle Dia (In)	.215 ✓		Temp Change Response ?	yes / no / yes / no
Area of Stack (ft^2)	6.305 ✓			
Sample Time	96 ✓			
Total Traverse Pts	24 ✓			

K Factor 2.9

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	1335 ✓			703.416									
A 1	4		.53	1.5	705.7	72	80	125	125	62	5	57		
2	8		.53	1.5	708.1	74	79	125	127	55	5	38		
3	12		.53	1.5	710.2	74	79	125	126	51	5	40		
4	16		.56	1.6	712.6	75	79	126	126	50	5	39		
5	20		.54	1.6	714.9	74	79	126	126	52	KA 5	38		
6	24		.52	1.5	717.1	75	79	126	126	55	5	38		
7	28		.50	1.5	719.5	75	79	125	125	55	5	38		
8	32		.48	1.4	721.6	75	80	125	125	55	5	39	A =	26.797
9	36		.48	1.4	723.8	75	80	126	126	55	5	40		
10	40		.46	1.3	726.0	75	79	125	125	55	4	39	Bc =	29.167
11	44		.46	1.3	728.1	74	80	126	126	55	4	38		
12	48	1423	.45	1.3	730.213	75	80	125	125	56	4	40		
													Mid LC	
B 1	4	1442	.28	.81	732.1	75	79	125	126	62	3	54	730.368	
2	8		.30	.87	733.8	76	79	126	126	54	3	41	(0.155)	
3	12		.32	.93	735.6	76	79	125	125	53	3	41		
4	16		.35	1.0	737.4	76	79	126	126	51	3	42		
5	20		.38	1.1	739.4	77	79	125	125	52	4	40	93.6	
6	24		.45	1.3	741.7	77	79	126	126	52	4	41		
7	28		.78	2.3	744.2	77	79	126	126	54	6	42	2.3% Mc	
8	32		.89	2.6	747.2	77	79	125	125	56	7	41		
9	36		.95	2.8	KA 750.3	78	80	126	126	57	8	40		
10	40		.97	2.8	753.4	78	80	125	125	58	8	41	15500	
11	44		.97	2.8	756.5	79	80	126	126	57	8	41		
12	48	1530 ✓	.96	2.8	759.535	79	80	125	125	58	8	41	55.5	
			Avg Delta P ✓	Avg Delta H ✓	Total Volume	Avg Ts ✓	Avg Tm ✓	Min/Max	Min/Max	Max	Max Vac	Min/Max		
			.568 ✓	1.646 ✓	55.964 ✓	75.75 ✓	79.375 ✓	125/126	125/126	62	8	38/57		
			Avg Sqrt Delta P	Avg Sqrt Del H	Comments:									
			.741 ✓	1.260 ✓	✓✓									

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

V. mid

.74086

CB Outlet

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

		Stack Conditions	Assumed	Actual
Client	Chemours			
W.O.#	15418			
Project ID	Chemours	% Moisture	4	
Mode/Source ID	Carbon Bed	Impinger Vol (ml)		
Samp. Loc. ID	OUT	Silica gel (g)		
Run No.ID	3	CO2, % by Vol	0.0	✓
Test Method ID	M0010	O2, % by Vol	20.9	✓
Date ID	25FEB2019	Temperature (°F)	70	78.458
Source/Location	VE North Outlet	Meter Temp (°F)	55	63.250
Sample Date	27 Feb 19 ✓	Static Press (in H_2O)		3.5 ✓
Baro. Press (in Hg)	30.20, 22 ✓			
Operator	KA/AS ✓	Ambient Temp (°F)	51	

Meter Box ID	22		
Meter Box Y	1.0010 ✓		
Meter Box Del H	2.4674		
Probe ID / Length	P706	6'	
Probe Material	Boro		
Pitot / Thermocouple ID	P706		
Pitot Coefficient	0.84 ✓		
Nozzle ID	.215		
Nozzle Measurements	.215	.215	.215
Avg Nozzle Dia (in)	.215 ✓		
Area of Stack (ft^2)	6.305		
Sample Time	96 ✓		
Total Traverse Pts	24 ✓		

	Initial	Mid-Point	Final
K Factor ~~2.9~~ 3.0			
Sample Train (ft^3)	0.002	0.004	.014
Leak Check @ (in Hg)	15"	6"	12"
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good KA	yes / no	yes / no	yes / no
Method 3 System good NA	~~yes / no~~	~~yes / no~~	~~yes / no~~
Temp Check	Pre-Test Set		Post-Test Set
Meter Box Temp	54		62
Reference Temp	53.9		63
Pass/Fail (+/- 2°)	Pass / Fail		Pass / Fail
Temp Change Response ?	yes / no		yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	0840 ✓			759.913									
A 1	4		.50	1.5	762.2	76	55	125	125	53	5	52		
2	8		.50	1.5	764.4	76	57	125	125	52	5	41		
3	12		.51	1.5	766.7	76	57	126	126	51	5	40		
4	16		.51	1.5	768.9	76	58	125	125	52	5	41		
5	20		.50	1.5	771.2	76	59	126	126	53	5	41		
6	24		.52	1.6	773.5	76	59	125	125	54	5	42		26.505
7	28		.48	1.4	775.7	76	60	126	126	53	5	41		
8	32		.46	1.4	777.9	77	61	125	125	53	5	43		
9	36		.46	1.4	780.0	77	61	126	126	53	5	43		
10	40		.47	1.4	782.2	77	62	126	126	54	5	43		
11	44		.44	1.3	784.3	77	62	125	125	54	4	44		
12	48	0928	.42	1.3	786.418	77	63	126	126	55	4	44		Mpol LC 786.573 (0.155)
B 1	4	0947	.27	.81	788.2	76	64	125	125	57	3	50		
2	8		.29	.87	790.0	80	65	126	126	54	3	47		
3	12		.30	.90	791.8	80	65	126	126	54	3	47		
4	16		.32	.96	793.6	81	66	125	125	54	3	47		
5	20		.34	1.0	795.4	81	66	125	125	59	4	49		
6	24		.43	1.3	797.6	81	66	126	126	60	4	50		
7	28		.73	2.2	800.3	81	67	125	125	62	5	50		29.091
8	32		.85	2.6	803.3	81	68	126	126	64	6	51		
9	36		.93	2.8	806.4	82	68	125	125	64	8	49		
10	40		.95	2.9	809.5	81	69	126	126	66	8	45		
11	44		.95	2.9	812.6	81	70	125	125	65	8	46		
12	48	1035 ✓	.95	2.9	815.664	81	70	126	126	64	8	45		
			Avg Delta P	Avg Delta H	Total Volume	Avg Ts	Avg Tm	Min/Max	Min/Max	Max	Max Vac	Min/Max		
			.545 ✓	1.643 ✓	55.596 ✓	78.458 ✓	63.25 ✓	125/126	125/126	66	8	40/52		
			Avg Sqrt Delta P	Avg Sqrt Del H	Comments:									
			.725 ✓	1.258 ✓	✓									

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

98.6
2.772 %M
1504.0
56.9 Vm

J AMM

.72467

CB Outlet

SAMPLE RECOVERY FIELD DATA

EPA Method 0010 - HFPO Dimer Acid

Client: Chemours | W.O. #: 15418
Location/Plant: Fayetteville, NC | Source & Location: VE North Outlet

Run No. 1 FR 230 | Sample Date 2/26/19 | Recovery Date 2/26/19
Sample I.D. Chemours - Carbon Bed - OUT - 1 - M0010 - | Analyst JM2/AS | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20		-1	-2			Silica Gel	
Final	2	100	98	0	309.1	304.2			315	
Initial	0	100	100	0	306.2	304.2			300	
Gain	2	0	-2	0	2.9	0		2.9	15	17.9

Impinger Color: all clear | Labeled? ✓
Silica Gel Condition: bl 90% | Sealed? ✓

Run No. 2 FR 230 BO | Sample Date 2/26/19 | Recovery Date 2/26/19
Sample I.D. Chemours - Carbon Bed - OUT - 2 - M0010 - | Analyst JM2/AS | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20		291.4				Silica Gel	
Final	5	100	100		296.5	310.3			318.2	
Initial	0	100	100		286.3	310.3			300	
Gain	5	0	0		5.1	0		10.1	18.2	28.3

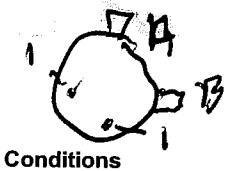
Impinger Color: all clear | Labeled? ✓
Silica Gel Condition: bl 90% | Sealed? ✓

Run No. 3 FR 230 | Sample Date 2/27/19 | Recovery Date 2/27/19
Sample I.D. Chemours - Carbon Bed - OUT - 3 - M0010 - | Analyst JM2/AS | Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	4	100	100		308.1	300.6			323.2	
Initial	0	100	100		301.5	301.9			300	
Gain	4	0	0		6.6	0		10.6	23.2	33.8

Impinger Color: all clear | Labeled? ✓
Silica Gel Condition: bl 90% | Sealed? ✓

Check COC for Sample IDs of Media Blanks



CB Outlet

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

Page 1 of 1

		Stack Conditions					
Client	Chemours		Assumed	Actual	Meter Box ID	22	
W.O.#	15418				Meter Box Y	1.0010 ✓	
Project ID	Chemours	% Moisture	4		Meter Box Del H	2.4679	
Mode/Source ID	Carbon Bed	Impinger Vol (ml)			Probe ID / Length	P706	6'
Samp. Loc. ID	OUT	Silica gel (g)			Probe Material	Boro	
Run No.ID	4	CO2, % by Vol	0.0	✓	Pitot / Thermocouple ID	P706	
Test Method ID	M0010	O2, % by Vol	20.9	✓	Pitot Coefficient	0.84 ✓	
Date ID	25FEB2019	Temperature (°F)	83	81.833	Nozzle ID	.215	
Source/Location	VE North Outlet	Meter Temp (°F)	71	71.500	Nozzle Measurements	.215 | .215 | .215	
Sample Date	27Feb19 ✓	Static Press (in H_2O)		3.5 ✓	Avg Nozzle Dia (in)	.215 ✓	
Baro. Press (in Hg)	KA ~~30.21~~ 30.17 ✓				Area of Stack (ft^2)	6.305 ✓	
Operator	KA/AS/JO ✓	Ambient Temp (°F)	62		Sample Time	96 ✓	
					Total Traverse Pts	24 ✓	

	Initial	Mid-Point	Final
Sample Train (ft^3)	0.012	0.009	0.014
Leak Check @ (in Hg)	15"	6"	13\
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
Method 3 System good	~~yes / no~~	~~yes / no~~	~~yes / no~~
Temp Check	Pre-Test Set		Post-Test Set
Meter Box Temp	63		65
Reference Temp	62		64
Pass/Fail (+/- 2°)	Pass / Fail		Pass / Fail
Temp Change Response ?	yes / no		yes / no

K Factor 3.0

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	1231 ✓			816.009									
A 1	4		.54	1.6	818.3	81	68	126	126	59	5	57		
2	8		.51	1.5	820.6	81	68	126	126	57	5	46		
3	12		.50	1.5	822.9	81	68	125	125	56	5	43		
4	16		.49	1.5	825.2	81	68	125	125	58	5	41		
5	20		.50	1.5	827.4	81	69	126	126	59	5	41		
6	24		.49	1.5	829.7	81	69	126	125	58	5	40		26.884
7	28		.47	1.4	831.9	81	70	126	126	57	5	41		
8	32		.46	1.4	834.1	81	70	126	126	56	5	41		
9	36		.46	1.4	836.3	82	71	125	125	56	5	41		
10	40		.46	1.4	838.5	82	71	126	126	56	5	43		
11	44		.45	1.4	840.6	82	72	125	125	56	5	43		
12	48	1319	.44	1.3	842.893	82	72	126	126	57	5	44		
														MP LC
B 1	4	1338	.27	.81	844.6	82	72	126	126	60	3	52		843.001
2	8		.28	.84	846.4	82	73	125	125	57	3	47		(0.108)
3	12		.30	.90	848.2	82	73	126	126	56	3	47		
4	16		.32	.96	850.0	82	73	125	125	58	3	47		
5	20		.35	1.1	852.0	82	73	126	125	58	3	48		
6	24		.44	1.3	854.1	82	73	125	125	60	4	48		29.137
7	28		.76	2.3	857.0	82	73	126	126	60	6	49		
8	32		.88	2.6	859.9	82	73	125	126	62	7	49		
9	36		.92	2.8	863.0	83	74	126	126	64	7	50		
10	40		.97	2.8	866.1	83	74	125	125	65	7	50		97.0%
11	44		.94	2.7	869.1	83	74	126	126	66	7	48		
12	48	1426 ✓	.94	2.7	872.133	83 ✓	75	125	125	65	7	46		2.7
			Avg Delta P ✓	Avg Delta H ✓	Total Volume ✓	Avg Ts ✓	Avg Tm ✓	Min/Max	Min/Max	Max	Max Vac	Min/Max		
			.548 ✓	1.634 ✓	56.016 ✓	81.833	71.500 ✓	125/126	125/126	66	7	40/57		
			Avg Sqrt Delta P	Avg Sqrt Del H	Comments:									15000
			.726 15 ✓	1.256 ✓	✓✓									56.4

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

✓ and ✓✓

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

Client	Chemours
W.O.#	15418
Project ID	Chemours
Mode/Source ID	Carbon Bed
Samp. Loc. ID	OUT
Run No.ID	5
Test Method ID	M0010
Date ID	25FEB2019
Source/Location	VE North Outlet
Sample Date	28 Feb 19 ✓
Baro. Press (In Hg)	29.95 ✓
Operator	KA/AS/JO ✓

Stack Conditions	Assumed	Actual
% Moisture	4	
Impinger Vol (ml)		
Silica gel (g)		
CO2, % by Vol	0.0	✓
O2, % by Vol	20.9	✓
Temperature (°F)	73	77.875
Meter Temp (°F)	66	61.375
Static Press (in H_2O)	3.5	3.5 ✓
Ambient Temp (°F)	53	

Meter Box ID	22
Meter Box Y	1.0010 ✓
Meter Box Del H	2.4674
Probe ID / Length	P706 / 6'
Probe Material	Boro
Pitot / Thermocouple ID	P706
Pitot Coefficient	0.84 ✓
Nozzle ID	.215
Nozzle Measurements	.215 / .215 / .215
Avg Nozzle Dia (in)	.215 ✓
Area of Stack (ft^2)	6.305
Sample Time	96 ✓
Total Traverse Pts	24 ✓

	Initial	Mid-Point	Final
Sample Train (ft^3)	0.010	0.004	0.018
Leak Check @ (in Hg)	15"	5"	11"
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
Method 3 System good	~~yes / no~~	~~yes / no~~	~~yes / no~~

K Factor 3.0

Temp Check	Pre-Test Set	Post-Test Set
Meter Box Temp	53	63
Reference Temp	51	62.8
Pass/Fail (+/- 2°)	Pass / Fail	Pass / Fail
Temp Change Response ?	yes / no	yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	0823 ✓			872.476									
A 1	4		.53	1.6	874.8	76	55	125	125	51	4	44		
2	8		.55	1.7	877.2	77	55	125	125	48	4	35		
3	12		.49	1.5	879.4	77	56	126	126	46	4	35		
4	16		.50	1.5	881.5	77	57	126	126	48	4	36		
5	20		.49	1.5	883.9	77	58	126	126	49	4	36		
6	24		.49	1.5	886.2	77	58	125	125	49	4	36		
7	28		.53	1.6	888.5	77	59	126	126	49	4	37		
8	32		.50	1.5	890.7	77	59	126	126	49	4	37		26.919
9	36		.47	1.4	892.9	78	60	125	125	50	4	37		
10	40		.45	1.4	895.1	78	61	126	126	50	4	38		
11	44		.43	1.3	897.2	77	61	126	126	50	4	38		
12	48	0911	.43	1.3	899.395	77	62	125	125	50	4	38		MP LC 899.519 (0.124)
B 1	4	0930	.28	.84	901.2	77	62	126	126	53	3	48		
2	8		.30	.90	902.9	78	63	125	125	50	3	40		
3	12		.30	.90	904.7	78	63	126	126	49	3	41		
4	16		.33	.99	906.6	78	64	126	126	50	3	41		
5	20		.35	1.1	908.6	79	64	126	127	51	3	42		
6	24		.43	1.3	910.7	79	64	126	126	52	4	43		
7	28		.76	2.3	913.4	79	64	125	126	53	6	43		29.233
8	32		.85	2.6	916.4	79	65	126	126	55	7	44		
9	36		.93	2.8	919.4	79	65	125	125	58	7	44		
10	40		.95	2.9	922.6	79	66	126	126	60	7	45		
11	44		.95	2.9	925.7	79	66	125	126	61	7	46		
12	48	1018 ✓	.93	2.8	928.752	80	66	126	126	61	7	46		
			Avg Delta P .551 ✓	Avg Delta H 1.672 ✓	Total Volume 56.152 ✓	Avg Ts 77.875 ✓	Avg Tm 61.375 ✓	Min/Max 125/126	Min/Max 125/127	Max 61	Max Vac 7	Min/Max 35/48		
			Avg Sqrt Delta P .7290B	Avg Sqrt Del H 1.270 ✓	Comments: ✓✓									

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

98.9 I
2.8
15065
57.7

CB OUTLET

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

		Stack Conditions	
Client	Chemours		Assumed / Actual
W.O.#	15418		
Project ID	Chemours	% Moisture	4
Mode/Source ID	Carbon Bed	Impinger Vol (ml)	
Samp. Loc. ID	OUT	Silica gel (g)	
Run No.ID	6 KA	CO2, % by Vol	0.0 / ✓
Test Method ID	M0010	O2, % by Vol	20.9 / ✓
Date ID	25FEB2019	Temperature (°F)	84 / 80.625
Source/Location	VE North Outlet	Meter Temp (°F)	74 / 76.708
Sample Date	27Feb19 ✓	Static Press (in H_2O)	3.5 / 3.5 ✓
Baro. Press (In Hg)	30.05 29.95 KA		
Operator	KA/AS/JO	Ambient Temp (°F)	69

Meter Box ID	22		
Meter Box Y	1.0010		
Meter Box Del H	2.4674		
Probe ID / Length	P706	6'	
Probe Material	Boro		
Pitot / Thermocouple ID	P706		
Pitot Coefficient	0.84 ✓		
Nozzle ID	.215		
Nozzle Measurements	.215	.215	.215
Avg Nozzle Dia (in)	.215 ✓		
Area of Stack (ft^2)	6.305 ✓		
Sample Time	96 ✓		
Total Traverse Pts	24 ✓		

	Initial	Mid-Point	Final
Sample Train (ft^3)	0.008	0.011	0.010
Leak Check @ (In Hg)	15"	5"	12"
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
Method 3 System good	yes / no	yes / no	yes / no
Temp Check	Pre-Test Set		Post-Test Set
Meter Box Temp	71		75
Reference Temp	70		74
Pass/Fail (+/- 2°)	Pass / Fail		Pass / Fail
Temp Change Response ?	yes / no		yes / no

K Factor 3.0

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	1429 ✓			929.208									
A 1	4		.51	1.5	931.5	80	KA 74	125	126	65	5	57		
2	8		.51	1.5	933.8	80	75	125	125	57	5	41		
3	12		.48	1.4	936.0	80	75	126	126	54	4	41		
4	16		.49	1.5	938.3	81	75	125	125	55	4	41		
5	20		.47	1.4	940.5	80	76	126	126	59	4	44		
6	24		.48	1.4	942.8	80	76	126	126	60	4	44		
7	28		.50	1.5	945.0	80	76	126	126	60	4	43		
8	32		.48	1.4	947.2	81	76	126	125	61	4	42		26.71
9	36		.47	1.4	949.4	81	77	126	126	60	4	43		
10	40		.45	1.4	951.7	81	77	126	126	60	4	42		
11	44		.42	1.3	953.7	81	77	125	125	60	4	43		
12	48	1517	.42	1.3	955.918	81	77	125	125	60	4	44		MP LC 956.065 (0.147)
B 1	4	1539	.27	.81	957.8	80	77	126	126	65	3	57		
2	8		.28	.84	959.5	80	77	126	126	60	3	44		
3	12		.30	.90	961.2	81	77	125	125	58	3	43		
4	16		.31	.93	963.1	81	77	126	126	57	3	44		
5	20		.34	1.0	965.0	81	77	125	125	58	3	45		
6	24		.40	1.2	967.0	81	77	126	126	58	3	45		29,022
7	28		.74	2.2	969.7	81	78	126	126	59	5	45		
8	32		.86	2.6	972.7	81	78	126	126	60	7	45		
9	36		.92	2.7	975.8	80	78	125	125	60	7	46		97.0 F
10	40		.97	2.8	978.8	81	78	126	126	61	7	46		
11	44		.97	2.8	982.1	81	78	126	126	62	7	47		3.3 M
12	48	1627 ✓	.95	2.8	985.087	81	78	126	126	62	7	47		
			Avg Delta P	Avg Delta H	Total Volume	Avg Ts ✓	Avg Tm ✓	Min/Max	Min/Max	Max	Max Vac	Min/Max		14800
			.541 ✓	1.608 ✓	55.732 ✓	80.625	76.708 ✓	125/126	125/126	65	7	41/57		
			Avg Sqrt Delta P	Avg Sqrt Del H	Comments:									55.1
			.7233 ✓	1.244 ✓	✓✓									Vm

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

J and ✓✓

CB Outlet

SAMPLE RECOVERY FIELD DATA

EPA Method 0010 - HFPO Dimer Acid

Client: Chemours | W.O. #: 15418
Location/Plant: Fayetteville, NC | Source & Location: VE North Outlet

Run No. 4 | Sample Date 2/27/19 | Recovery Date 2/27/19
Sample I.D. Chemours - Carbon Bed - OUT - 4 - M0010 - | Analyst JDD/RS | Filter Number N/A

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	4	100	100		298.0	305.3			322.5	
Initial	0	100	100		291.7	306.4			300	
Gain	4	0	0		6.3	0		10.3 ✓	22.5 ✓	32.8

Impinger Color: all clear | Labeled? ✓
Silica Gel Condition: blue 90% | Sealed? ✓

Run No. 5 | Sample Date 2/28/19 | Recovery Date 2/28/19
Sample I.D. Chemours - Carbon Bed - OUT - 5 - M0010 - | Analyst JDD/RS | Filter Number N/A

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	6	100	100	0	294.8	304.0			321.0	
Initial	0	100	100	0	286.7	304.7			300	
Gain	6	0	0	0	8.1	0		14.1 ✓	21 ✓	35.1

Impinger Color: all clear | Labeled? ✓
Silica Gel Condition: blue 95% | Sealed? ✓

Run No. 6 FR 150 130 | Sample Date 2/28/19 | Recovery Date 2/28/19
Sample I.D. Chemours - Carbon Bed - OUT - 6 - M0010 - | Analyst JDD/RS | Filter Number N/A

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	8	100	100	0	309.1	297.4			322.0	
Initial	0	100	100	0	299.3	297.7			300	
Gain	8	0	0	0	9.8	0		17.8 ✓	22 ✓	39.8 ✓

Impinger Color: all clear | Labeled? ✓
Silica Gel Condition: blue 95% | Sealed? ✓

Check COC for Sample IDs of Media Blanks

WESTON SOLUTIONS

	Balance weight	result
2/28/19	500.0	499.8 ✓

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

Page 1 of 1

		Stack Conditions	Assumed	Actual
Client	Chemours	% Moisture	4	
W.O.#	15418	Impinger Vol (ml)		
Project ID	Chemours	Silica gel (g)		
Mode/Source ID	Carbon Bed	CO2, % by Vol	0.0	✓
Samp. Loc. ID	OUT	O2, % by Vol	20.9	✓
Run No.ID	7	Temperature (°F)	69	72.417
Test Method ID	M0010	Meter Temp (°F)	59	56.417
Date ID	25FEB2019	Static Press (in H_2O)	3.5	3.5 ✓
Source/Location	VE North Outlet	Ambient Temp (°F)	47	
Sample Date	1 Mar 19 ✓			
Baro. Press (In Hg)	30.09 ✓			
Operator	KA/AS/JO ✓			

Meter Box ID	A22
Meter Box Y	1.0010 ✓
Meter Box Del H	2.4674
Probe ID / Length	P706 / 6'
Probe Material	Boro
Pitot / Thermocouple ID	P706
Pitot Coefficient	0.84 ✓
Nozzle ID	.215
Nozzle Measurements	.215 / .215 / .215
Avg Nozzle Dia (in)	.215 ✓
Area of Stack (ft^2)	6.305 ✓
Sample Time	96 ✓
Total Traverse Pts	24 ✓

	Initial	Mid-Point	Final
K Factor 3.0			
Sample Train (ft^3)	0.008	0.003	0.006
Leak Check @ (in Hg)	15"	5"	10"
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
Method 3 System good	~~yes / no~~	~~yes / no~~	~~yes / no~~
Temp Check	Pre-Test Set		Post-Test Set
Meter Box Temp	49		53
Reference Temp	49		52
Pass/Fail (+/- 2°)	Pass / Fail		Pass / Fail
Temp Change Response ?	yes / no		yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft^3)	STACK TEMP (°F)	DGM OUTLET TEMP (°F)	PROBE TEMP (°F)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	0813 ✓			985.420									
A 1	4		.54	1.6	987.7	71	51	126	126	47	4	49		
2	8		.53	1.6	990.0	72	51	126	126	48	4	36		
3	12		.53	1.6	992.4	72	52	126	126	49	4	35		
4	16		.55	1.7	994.6	72	53	126	126	51	4	35		
5	20		.51	1.5	996.9	72	53	126	126	51	4	36		
6	24		.50	1.5	999.2	72	54	126	126	50	4	36		
7	28		.49	1.5	1001.4	72	54	125	125	49	4	35		26.646
8	32		.45	1.4	1003.6	72	55	125	125	49	4	34		
9	36		.45	1.4	1005.8	72	55	125	126	48	4	35		
10	40		.44	1.3	1007.8	72	56	125	125	49	4	35		
11	44		.42	1.3	1009.9	72	56	126	126	48	4	35		
12	48	0901	.42	1.3	1012.066	72	57	126	126	48	4	35		MP LC
										4 KA				1012.205
B 1	4	0920	.27	.81	1013.9	72	58	125	126	48	3	44		(0.139)
2	8		.27	.81	1015.6	73	57	125	126	45	3	35		
3	12		.30	.90	1017.3	73	58	126	125	45	3	36		
4	16		.33	.99	1019.2	73	58	126	126	45	3	36		
5	20		.37	1.1	~~19~~ KA 1021.2	73	58	125	125	46	3	36		
6	24		.44	1.3	1023.4	73	58	126	126	46	4	37		29.177
7	28		.77	2.2	1026.0	73	59	125	125	47	5	35		
8	32		.90	2.7	1029.0	73	59	126	125	49	6	35		
9	36		.97	2.9	1032.1	73	60	126	126	51	7	36		
10	40		.98	2.9	1035.2	73	60	126	125	50	7	36		98.6 ✓
11	44		.97	2.9	1038.2	73	61	126	125	50	7	36		2:7 M
12	48	1008 ✓	.95	2.9	1041.338	73	61	125	126	50	7	36		
			Avg Delta P .556 ✓	Avg Delta H 1.671 ✓	Total Volume 55.779 ✓	Avg Ts 72.417 ✓	Avg Tm 56.417 ✓	Min/Max 125/126	Min/Max 125/126	Max 51	Max Vac 7	Min/Max 35/49		15200
			Avg Sqrt Delta P .7319 ✓	Avg Sqrt Del H 1.268	Comments:									57.6

EPA Method 0010 from EPA SW-846

C15 OUT

ISOKINETIC FIELD DATA SHEET

EPA Method 0010 - HFPO Dimer Acid

Page 1 of 1

		Stack Conditions	Assumed	Actual				
Client	Chemours				Meter Box ID	22		
W.O.#	15418				Meter Box Y	1.0010 ✓		
Project ID	Chemours	% Moisture	9		Meter Box Del H	2.4679		
Mode/Source ID	Carbon Bed	Impinger Vol (ml)			Probe ID / Length	P706	6'	Sample Train (ft³)
Samp. Loc. ID	OUT	Silica gel (g)			Probe Material	Boro		Leak Check @ (in Hg)
Run No.ID	8	CO2, % by Vol	0.0	✓	Pitot / Thermocouple ID	P706		Pitot leak check good
Test Method ID	M0010	O2, % by Vol	20.9	✓	Pitot Coefficient	0.84 ✓		Pitot Inspection good
Date ID	25FEB2019	Temperature (°F)	77	77.250	Nozzle ID	.215		Method 3 System good
Source/Location	VE North Outlet	Meter Temp (°F)	68	67.125	Nozzle Measurements	.215 / .215 / .215		**Temp Check**
Sample Date	1 Mar 19 ✓	Static Press (in H_2O)	3.5	3.5 ✓	Avg Nozzle Dia (in)	.215 ✓		Meter Box Temp
Baro. Press (in Hg)	30.08 ✓				Area of Stack (ft²)	6.305 ✓		Reference Temp
Operator	KA/BS/JO/AS ✓	Ambient Temp (°F)	52		Sample Time	96 ✓		Pass/Fail (+/- 2°)
					Total Traverse Pts	24 ✓		Temp Change Response ?

K Factor 3.0

	Initial	Mid-Point	Final
Sample Train (ft³)	0.005	0.010	.007
Leak Check @ (in Hg)	15"	5"	8"
Pitot leak check good	yes / no	yes / no	yes / no
Pitot Inspection good	yes / no	yes / no	yes / no
Method 3 System good	~~yes / no~~	~~yes / no~~	yes / no
Temp Check	Pre-Test Set		Post-Test Set
Meter Box Temp	59		63
Reference Temp	57		62
Pass/Fail (+/- 2°)	(Pass) / Fail		(Pass) / Fail
Temp Change Response ?	yes / no		yes / no

TRAVERSE POINT NO.	SAMPLE TIME (min)	CLOCK TIME (plant time)	VELOCITY PRESSURE Delta P (in H2O)	ORIFICE PRESSURE Delta H (in H2O)	DRY GAS METER READING (ft³)	STACK TEMP (°F)	DGM OUTLET TEMP (oF)	PROBE TEMP (oF)	FILTER BOX TEMP (F)	IMPINGER EXIT TEMP (oF)	SAMPLE TRAIN VAC (in Hg)	XAD EXIT TEMP (F)		COMMENTS
	0	1237 ✓			041.641									
A 1	4		.50	1.5	43.9	72	63	126	126	56	4	52		
2	8		.49	1.5	45.6	76	63	125	125	53	4	43		
3	12		.52	1.6	48.5	76	63	125	125	52	4	40		
4	16		.54	1.6	50.8	77	64	126	126	56	4	38		
5	20		.54	1.6	53.1	77	64	125	125	56	4	37		
6	24		.53	1.6	55.5	77	65	126	126	56	4	37		
7	28		.50	1.5	57.8	77	65	125	125	56	4	37		
8	32		.48	1.4	59.9	77	66	126	126	54	4	38		
9	36		.47	1.4	62.1	77	66	125	125	54	4	37		
10	40		.45	1.4	64.5	77	67	125	125	53	4	37		
11	44		.45	1.4	66.5	77	67	126	126	53	4	38		
12	48	1325	.42	1.3	68.643	77	67	126	126	52	4	38		MP LC 68.896 .253
B 1	4	1345	.26	.78	70.5	74	68	125	126	58	3	49		
2	8		.27	.81	72.1	78	68	126	126	54	3	40		
3	12		.29	.87	73.8	78	68	126	126	51	3	40		
4	16		.32	.96	75.8	78	69	126	126	52	3	40		
5	20		.35	1.1	77.7	78	69	126	126	52	3	39		
6	24		.42	1.3	79.9	78	69	126	126	53	3	40		
7	28		.72	2.2	82.6	78	69	126	126	53	5	40		
8	32		.83	2.5	85.5	79	70	125	126	54	6	39		
9	36		.90	2.7	88.5	79	70	126	126	57	7	39		
10	40		.92	2.8	91.6	79	70	126	126	58	7	40		
11	44		.93	2.8	94.7	79	70	125	125	58	7	40		
12	48	1433 ✓	.93	2.8	97.716	79	71	126	126	58	7	41		
			Avg Delta P ✓ .543	Avg Delta H ✓ 1.643	Total Volume ✓ 55.822	Avg Ts ✓ 77.250	Avg Tm ✓ 67.125	Min/Max 125/126	Min/Max 125/126	Max 58	Max Vac 7	Min/Max 37/52		
			Avg Sqrt Delta P ✓ .723	Avg Sqrt Del H ✓ 1.259	Comments:									

WESTON SOLUTIONS

EPA Method 0010 from EPA SW-846

CB OUT

SAMPLE RECOVERY FIELD DATA

EPA Method 0010 - HFPO Dimer Acid

Client	Chemours	W.O. #	15418
Location/Plant	Fayetteville, NC	Source & Location	VE North Outlet

Run No. 7 — Sample Date 3/1/19 — Recovery Date 3/1/19

Sample I.D. Chemours - Carbon Bed - OUT - 7 - M0010 - — Analyst SMD/AS — Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	8	107	107	0		311.7	269.6		317.4	
Initial	0	100	100	0		302.9	269.7		300	
Gain	8	0	0	0		8.8	0	16.8	17.4	34.2

Impinger Color all clear — Labeled? ✓

Silica Gel Condition 4h 95% — Sealed?

Run No. 8 — Sample Date 3/1/19 — Recovery Date 3/1/19

Sample I.D. Chemours - Carbon Bed - OUT - 8 - M0010 - — Analyst SMD/AS — Filter Number NA

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final	5	100	100			322.3	302.5		319.7	
Initial	0	100	100			314.5	303.2		300	
Gain	5	0	0			7.8	0	12.8	19.7	

Impinger Color all clear — Labeled? ✓

Silica Gel Condition 4h 95% — Sealed? ✓

Run No. — — Sample Date — — Recovery Date —

Sample I.D. Chemours - Carbon Bed - OUT - 0 - M0010 - — Analyst — — Filter Number —

	Impinger									
	1	2	3	4	5	6	7	Imp.Total	8	Total
Contents	Empty	HPLC H20	HPLC H20						Silica Gel	
Final										
Initial		100	100						300	
Gain										

Impinger Color — — Labeled? —

Silica Gel Condition — — Sealed? —

Check COC for Sample IDs of Media Blanks

Balance Known 500.

Rev 17 499.8 ✓

3/1/19

METHODS AND ANALYZERS

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Date: **25 Feb 2019**

Folders.A-F\Chemours Fayetteville\15418.002.010 VE North 2019\Data\FEBUARY_MARCH 2019\022519 DIVISIO

Program Version: 2.1, built 19 May 2017 **File Version:** 2.03
Computer: WSWCAIRSERVICES **Trailer:** 27
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**21.0**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**16.6**

CALIBRATION DATA

Number 1

Client: **Chemours**
Location: **CHEMOURS**
Source: **VE North Carbon Bed/Division**

Project Number: **15418.002.010**
Operator: **SD**
Date: **25 Feb 2019**

Start Time: 10:59

O_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
12.0	CC18055
21.0	SG9169108

Calibration Results

Zero	6 mv
Span, 21.0 %	7997 mv

Curve Coefficients

Slope	**Intercept**
380.5	6

CO_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
8.9	CC18055
16.6	SG9169108

Calibration Results

Zero	4 mv
Span, 16.6 %	8287 mv

Curve Coefficients

Slope	**Intercept**
499.6	4

CALIBRATION ERROR DATA

Number 1

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **25 Feb 2019**

Start Time: 10:59

O_2
Method: EPA 3A
Span Conc. 21.0 %
Slope 380.5 **Intercept** 6.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
12.0	12.0	0.0	0.0	Pass
21.0	21.0	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 16.6 %
Slope 499.6 **Intercept** 4.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
8.9	8.9	0.0	0.0	Pass
16.6	16.6	0.0	0.0	Pass

BIAS

Number 1

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **25 Feb 2019**

Start Time: 11:05

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.9	8.8	-0.1	-0.6	Pass

RUN DATA

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **25 Feb 2019**

Time	O_2 %	CO_2 %
response times		
11:07:50	12.1	8.8
11:08:00	16.9	4.7
11:08:10	20.4	0.9
11:08:20	20.7	0.4
11:08:30	12.4	2.0
11:08:40	1.6	0.6
11:08:50	0.1	0.1
O2/CO2 UP		
11:09:00	0.0	0.0
11:09:10	0.0	0.0
11:09:20	0.0	0.0
11:09:30	3.0	1.8
11:09:40	10.4	7.1
11:09:50	11.8	8.6
11:10:00	12.0	8.8
O2/CO2 DOWN		
11:10:10	12.0	8.8
11:10:20	12.0	8.8
11:10:30	12.0	8.8
11:10:40	9.6	7.2
11:10:50	1.5	1.8
11:11:00	0.1	0.3
11:11:10	0.0	0.1
END		
11:11:20	0.0	0.1
11:11:30	0.0	0.1
Avgs	**7.3**	**3.5**

RUN SUMMARY

Client: **Chemours** | Project Number: **15418.002.010**
Location: **CHEMOURS** | Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** | Date: **25 Feb 2019**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 11:07:40 to 11:11:30

Run Averages

7.3	3.5

Pre-run Bias at 11:05

Zero Bias	0.0	0.0
Span Bias	12.0	8.8
Span Gas	12.0	8.9

Post-run Bias at 07:37

Zero Bias	0.0	0.1
Span Bias	12.0	8.9
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

7.3	3.4

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **26 Feb 2019**

Start Time: 07:37

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

*Bias No. 1

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.9	8.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.8	8.9	0.1	0.6	Pass

*Bias No. 1

RUN DATA

Number 1

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **26 Feb 2019**

Time	O_2 %	CO_2 %
	RUN 1	
	PORT 1	
09:27	20.9	0.1
09:28	20.9	0.1
09:29	20.9	0.1
09:30	20.9	0.1
09:31	20.9	0.1
09:32	20.9	0.1
09:33	20.9	0.2
09:34	20.9	0.2
09:35	20.9	0.2
09:36	20.9	0.2
09:37	20.9	0.2
09:38	20.9	0.2
09:39	20.9	0.2
09:40	20.9	0.2
09:41	20.9	0.2
09:42	20.9	0.2
09:43	20.9	0.2
09:44	20.9	0.2
09:45	20.9	0.2
09:46	20.9	0.2
09:47	20.9	0.2
09:48	20.9	0.2
09:49	20.9	0.2
09:50	20.9	0.2
09:51	20.9	0.2
09:52	20.9	0.2
09:53	20.9	0.2
09:54	20.9	0.2
09:55	20.9	0.2
09:56	20.9	0.2
09:57	20.9	0.2
09:58	20.9	0.2
09:59	20.9	0.2
10:00	20.9	0.2
10:01	20.9	0.2
10:02	20.9	0.2
10:03	20.9	0.2
10:04	20.9	0.2

RUN DATA

Number 1

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **26 Feb 2019**

Time	O_2 %	CO_2 %
10:05	20.9	0.2
10:06	20.9	0.2
10:07	20.9	0.2
10:08	20.9	0.2
10:09	20.9	0.2
10:10	20.9	0.2
10:11	20.9	0.2
10:12	20.9	0.2
10:13	20.9	0.2
10:14	20.9	0.2
10:15	20.9	0.2
PORT CHANGE		
PORT 2		
10:55	20.9	0.1
10:56	20.9	0.1
10:57	20.8	0.1
10:58	20.8	0.2
10:59	20.8	0.2
11:00	20.9	0.2
11:01	20.9	0.3
11:02	20.9	0.3
11:03	20.9	0.3
11:04	20.9	0.2
11:05	20.9	0.2
11:06	20.9	0.2
11:07	20.9	0.2
11:08	20.9	0.2
11:09	20.9	0.2
11:10	20.9	0.2
11:11	20.9	0.2
11:12	20.9	0.2
11:13	20.9	0.2
11:14	20.9	0.2
11:15	20.9	0.2
11:16	20.9	0.2
11:17	20.9	0.2
11:18	20.9	0.2
11:19	20.9	0.2
11:20	20.9	0.2
11:21	20.9	0.2

RUN DATA

Number 1

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **26 Feb 2019**

Time	O_2 %	CO_2 %
11:22	20.9	0.2
11:23	20.9	0.2
11:24	20.9	0.2
11:25	20.9	0.2
11:26	20.9	0.2
11:27	20.9	0.2
11:28	20.9	0.2
11:29	20.9	0.2
11:30	20.9	0.1
11:31	20.9	0.1
11:32	20.9	0.1
11:33	20.9	0.1
11:34	20.9	0.1
11:35	20.9	0.1
11:36	20.9	0.1
11:37	20.9	0.1
11:38	20.9	0.1
11:39	20.9	0.1
11:40	20.9	0.1
11:41	20.9	0.1
11:42	20.9	0.1
11:43	20.9	0.1
Avgs	**20.9**	**0.2**

RUN SUMMARY

Number 1

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **26 Feb 2019**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 09:26 to 11:43

Run Averages

20.9	0.2

Pre-run Bias at 07:37

Zero Bias	0.0	0.1
Span Bias	12.0	8.9
Span Gas	12.0	8.9

Post-run Bias at 11:44

Zero Bias	0.0	0.1
Span Bias	12.0	8.9
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

20.9	0.1

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **26 Feb 2019**

Start Time: 11:44

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

*Bias No. 2

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.9	8.9	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.1	0.1	0.0	0.0	Pass
Span	8.9	8.9	0.0	0.0	Pass

*Bias No. 2

RUN DATA

Number 2

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **26 Feb 2019**

Time	O_2 %	CO_2 %
	R2 START	
13:35	20.8	0.1
13:36	20.7	0.5
13:37	20.7	0.6
13:38	20.8	0.4
13:39	20.8	0.3
13:40	20.8	0.3
13:41	20.8	0.2
13:42	20.8	0.2
13:43	20.8	0.2
13:44	20.8	0.2
13:45	20.8	0.2
13:46	20.8	0.2
13:47	20.9	0.2
13:48	20.9	0.2
13:49	20.9	0.1
13:50	20.9	0.2
13:51	20.9	0.2
13:52	20.8	0.2
13:53	20.8	0.2
13:54	20.8	0.2
13:55	20.8	0.2
13:56	20.8	0.2
13:57	20.8	0.1
13:58	20.8	0.1
13:59	20.8	0.1
14:00	20.8	0.1
14:01	20.8	0.1
14:02	20.8	0.1
14:03	20.8	0.1
14:04	20.8	0.1
14:05	20.8	0.1
14:06	20.8	0.1
14:07	20.8	0.1
14:08	20.8	0.1
14:09	20.9	0.1
14:10	20.8	0.1
14:11	20.8	0.1
14:12	20.8	0.1
14:13	20.8	0.1

RUN DATA

Number 2

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **26 Feb 2019**

Time	O_2 %	CO_2 %
14:14	20.8	0.1
14:15	20.8	0.1
14:16	20.8	0.1
14:17	20.8	0.1
14:18	20.8	0.1
14:19	20.8	0.1
14:20	20.8	0.1
14:21	20.8	0.1
14:22	20.8	0.1
14:23	20.8	0.1
PORT CHANGE		
PORT 2		
14:42	20.8	0.1
14:43	20.8	0.1
14:44	20.8	0.1
14:45	20.8	0.1
14:46	20.8	0.1
14:47	20.8	0.1
14:48	20.8	0.1
14:49	20.8	0.1
14:50	20.8	0.1
14:51	20.8	0.1
14:52	20.8	0.1
14:53	20.8	0.1
14:54	20.8	0.1
14:55	20.8	0.1
14:56	20.8	0.1
14:57	20.8	0.1
14:58	20.8	0.1
14:59	20.8	0.1
15:00	20.8	0.1
15:01	20.8	0.1
15:02	20.8	0.1
15:03	20.8	0.1
15:04	20.8	0.1
15:05	20.8	0.1
15:06	20.8	0.1
15:07	20.8	0.1
15:08	20.8	0.1
15:09	20.8	0.1

RUN DATA

Number 2

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **26 Feb 2019**

Time	O_2 %	CO_2 %
15:10	20.8	0.1
15:11	20.8	0.1
15:12	20.8	0.1
15:13	20.8	0.1
15:14	20.8	0.1
15:15	20.8	0.1
15:16	20.8	0.1
15:17	20.8	0.1
15:18	20.8	0.1
15:19	20.8	0.1
15:20	20.8	0.1
15:21	20.8	0.1
15:22	20.8	0.1
15:23	20.8	0.1
15:24	20.8	0.1
15:25	20.8	0.1
15:26	20.8	0.1
15:27	20.8	0.1
15:28	20.8	0.1
15:29	20.8	0.1
15:30	20.8	0.1
Avgs	**20.8**	**0.1**

RUN SUMMARY

Number 2

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **26 Feb 2019**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 13:34 to 15:30

Run Averages

20.8	0.1

Pre-run Bias at 11:44

Zero Bias	0.0	0.1
Span Bias	12.0	8.9
Span Gas	12.0	8.9

Post-run Bias at 15:33

Zero Bias	0.0	0.1
Span Bias	11.9	9.0
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

20.9	0.0

BIAS AND CALIBRATION DRIFT

Number 4

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **26 Feb 2019**

Start Time: 15:33

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	11.9	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	11.9	-0.1	-0.5	Pass

*Bias No. 3

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.9	9.0	0.1	0.6	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.1	0.1	0.0	0.0	Pass
Span	8.9	9.0	0.1	0.6	Pass

*Bias No. 3

METHODS AND ANALYZERS

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Date: **27 Feb 2019**

Folders.A-F\Chemours Fayetteville\15418.002.010 VE North 2019\Data\FEBUARY_MARCH 2019\022719DIVISION

Program Version: 2.1, built 19 May 2017 **File Version:** 2.03
Computer: WSWCAIRSERVICES **Trailer:** 27
Analog Input Device: Keithley KUSB-3108

Channel 1

Analyte	**O_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**25.0**
Span Concentration, %	**21.0**

Channel 2

Analyte	**CO_2**
Method	**EPA 3A**, Using Bias
Analyzer Make, Model & Serial No.	**Servomex 4900**
Full-Scale Output, mv	**10000**
Analyzer Range, %	**20.0**
Span Concentration, %	**16.6**

CALIBRATION DATA

Number 1

Client: **Chemours**
Location: **CHEMOURS**
Source: **VE North Carbon Bed/Division**

Project Number: **15418.002.010**
Operator: **SD**
Date: **27 Feb 2019**

Start Time: 07:29

O_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
12.0	CC18055
21.0	SG9169108

Calibration Results

Zero	-3 mv
Span, 21.0 %	8006 mv

Curve Coefficients

Slope	**Intercept**
381.4	-3

CO_2

Method: EPA 3A
Calibration Type: Linear Zero and High Span

Calibration Standards

%	**Cylinder ID**
8.9	CC18055
16.6	SG9169108

Calibration Results

Zero	-5 mv
Span, 16.6 %	8288 mv

Curve Coefficients

Slope	**Intercept**
500.2	-5

CALIBRATION ERROR DATA

Number 1

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **27 Feb 2019**

Start Time: 07:29

O_2
Method: EPA 3A
Span Conc. 21.0 %
Slope 381.4 **Intercept** -3.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
12.0	12.1	0.1	0.5	Pass
21.0	21.0	0.0	0.0	Pass

CO_2
Method: EPA 3A
Span Conc. 16.6 %
Slope 500.2 **Intercept** -5.0

Standard %	Result %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	Pass
8.9	8.6	-0.3	-1.8	Pass
16.6	16.6	0.0	0.0	Pass

BIAS

Number 1

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **27 Feb 2019**

Start Time: 07:39

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.1	12.0	-0.1	-0.5	Pass

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.6	8.4	-0.2	-1.2	Pass

RUN DATA

Number 1

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **27 Feb 2019**

Time	O_2 %	CO_2 %
	RUN 3	
	POINT 1	
08:40	20.8	0.1
08:41	20.7	0.1
08:42	20.8	0.1
08:43	20.8	0.1
08:44	20.8	0.1
08:45	20.8	0.1
08:46	20.8	0.1
08:47	20.8	0.1
08:48	20.8	0.1
08:49	20.8	0.1
08:50	20.8	0.1
08:51	20.8	0.1
08:52	20.8	0.1
08:53	20.8	0.1
08:54	20.8	0.1
08:55	20.9	0.1
08:56	20.9	0.1
08:57	20.9	0.1
08:58	20.9	0.1
08:59	20.9	0.1
09:00	20.9	0.1
09:01	20.9	0.1
09:02	20.9	0.1
09:03	20.9	0.1
09:04	20.9	0.1
09:05	20.9	0.1
09:06	20.9	0.1
09:07	20.9	0.1
09:08	20.9	0.1
09:09	20.9	0.1
09:10	20.9	0.1
09:11	20.9	0.1
09:12	20.9	0.1
09:13	20.9	0.1
09:14	20.9	0.1
09:15	20.9	0.1
09:16	20.9	0.1
09:17	20.9	0.1

RUN DATA

Number 1

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **27 Feb 2019**

Time	O_2 %	CO_2 %
09:18	20.9	0.1
09:19	20.9	0.1
09:20	20.9	0.1
09:21	20.9	0.1
09:22	20.9	0.1
09:23	20.9	0.1
09:24	20.9	0.1
09:25	20.9	0.1
09:26	20.9	0.1
09:27	20.9	0.1
09:28	20.9	0.1
PORT CHANGE		
PORT 2		
09:47	20.8	0.1
09:48	20.8	0.1
09:49	20.8	0.1
09:50	20.8	0.1
09:51	20.7	0.1
09:52	20.7	0.1
09:53	20.7	0.1
09:54	20.8	0.1
09:55	20.9	0.1
09:56	20.9	0.1
09:57	20.9	0.1
09:58	20.9	0.1
09:59	20.9	0.1
10:00	20.9	0.1
10:01	20.9	0.1
10:02	20.9	0.1
10:03	20.9	0.1
10:04	20.9	0.1
10:05	20.9	0.1
10:06	20.9	0.1
10:07	20.9	0.1
10:08	20.9	0.1
10:09	20.9	0.1
10:10	20.9	0.1
10:11	20.9	0.1
10:12	20.9	0.1
10:13	20.9	0.1

RUN DATA

Number 1

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **27 Feb 2019**

Time	O_2 %	CO_2 %
10:14	20.9	0.1
10:15	20.9	0.1
10:16	20.9	0.1
10:17	20.9	0.1
10:18	20.9	0.1
10:19	20.9	0.1
10:20	20.9	0.1
10:21	20.9	0.1
10:22	20.9	0.1
10:23	20.9	0.1
10:24	20.9	0.1
10:25	20.9	0.1
10:26	20.9	0.1
10:27	20.9	0.1
10:28	20.9	0.1
10:29	20.9	0.1
10:30	20.9	0.1
10:31	20.9	0.1
10:32	20.9	0.1
10:33	20.9	0.1
10:34	20.9	0.1
10:35	20.9	0.1
Avgs	**20.9**	**0.1**

RUN SUMMARY

Number 1

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **27 Feb 2019**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 08:39 to 10:35

Run Averages

20.9	0.1

Pre-run Bias at 07:39

Zero Bias	0.0	0.1
Span Bias	12.0	8.4
Span Gas	12.0	8.9

Post-run Bias at 10:36

Zero Bias	0.0	0.1
Span Bias	12.1	8.4
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

20.8	0.0

BIAS AND CALIBRATION DRIFT

Number 2

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **27 Feb 2019**

Start Time: 10:36

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.1	12.1	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	12.1	0.1	0.5	Pass

*Bias No. 1

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.6	8.4	-0.2	-1.2	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.1	0.1	0.0	0.0	Pass
Span	8.4	8.4	0.0	0.0	Pass

*Bias No. 1

RUN DATA

Number 2

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **27 Feb 2019**

Time	O_2 %	CO_2 %
RUN 4		
PORT 1 ONLY (SEE NEXT RUN FOR SECOND PORT)		
12:31	20.7	0.1
12:32	20.7	0.1
12:33	20.7	0.1
12:34	20.7	0.1
12:35	20.7	0.1
12:36	20.7	0.1
12:37	20.7	0.1
12:38	20.7	0.1
12:39	20.7	0.1
12:40	20.7	0.1
12:41	20.7	0.1
12:42	20.7	0.1
12:43	20.7	0.1
12:44	20.7	0.1
12:45	20.7	0.1
12:46	20.7	0.1
12:47	20.7	0.1
12:48	20.7	0.1
12:49	20.7	0.1
12:50	20.7	0.1
12:51	20.7	0.1
12:52	20.7	0.1
12:53	20.7	0.1
12:54	20.7	0.1
12:55	20.7	0.1
12:56	20.8	0.1
12:57	20.8	0.1
12:58	20.8	0.1
12:59	20.8	0.1
13:00	20.8	0.1
13:01	20.8	0.1
13:02	20.8	0.1
13:03	20.8	0.1
13:04	20.8	0.1
13:05	20.8	0.1
13:06	20.8	0.1
13:07	20.8	0.1
13:08	20.8	0.1

RUN DATA

Number 2

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **27 Feb 2019**

Time	O_2 %	CO_2 %
13:09	20.8	0.1
13:10	20.8	0.1
13:11	20.8	0.1
13:12	20.8	0.1
13:13	20.8	0.1
13:14	20.8	0.1
13:15	20.8	0.1
13:16	20.8	0.1
13:17	20.8	0.1
13:18	20.8	0.1
13:19	20.8	0.1
Avgs	**20.7**	**0.1**

RUN SUMMARY

Number 2

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **27 Feb 2019**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 12:30 to 13:19

Run Averages

20.7	0.1

Pre-run Bias at 10:36

Zero Bias	0.0	0.1
Span Bias	12.1	8.4
Span Gas	12.0	8.9

Post-run Bias at 13:21

Zero Bias	0.1	0.0
Span Bias	12.0	8.4
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

20.7	0.1

BIAS AND CALIBRATION DRIFT

Number 3

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **27 Feb 2019**

Start Time: 13:21

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.5	Pass
Span	12.1	12.0	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.1	0.1	0.5	Pass
Span	12.1	12.0	-0.1	-0.5	Pass

*Bias No. 2

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.4	-0.2	-1.2	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.1	0.0	-0.1	-0.6	Pass
Span	8.4	8.4	0.0	0.0	Pass

*Bias No. 2

RUN DATA

Number 3

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **27 Feb 2019**

Time	O_2 %	CO_2 %
	RUN 4	
	PORT 2	
13:38	20.7	0.1
13:39	20.7	0.1
13:40	20.7	0.1
13:41	20.7	0.2
13:42	20.6	0.2
13:43	20.6	0.2
13:44	20.7	0.2
13:45	20.7	0.2
13:46	20.8	0.2
13:47	20.8	0.2
13:48	20.8	0.2
13:49	20.8	0.2
13:50	20.8	0.2
13:51	20.8	0.2
13:52	20.8	0.2
13:53	20.8	0.2
13:54	20.8	0.2
13:55	20.8	0.2
13:56	20.8	0.2
13:57	20.8	0.2
13:58	20.8	0.2
13:59	20.8	0.2
14:00	20.8	0.2
14:01	20.8	0.2
14:02	20.8	0.2
14:03	20.8	0.1
14:04	20.8	0.1
14:05	20.8	0.1
14:06	20.8	0.1
14:07	20.8	0.1
14:08	20.8	0.1
14:09	20.8	0.1
14:10	20.8	0.1
14:11	20.8	0.1
14:12	20.8	0.1
14:13	20.8	0.1
14:14	20.8	0.1
14:15	20.8	0.1

RUN DATA

Number 3

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **27 Feb 2019**

Time	O_2 %	CO_2 %
14:16	20.8	0.1
14:17	20.8	0.1
14:18	20.8	0.1
14:19	20.8	0.1
14:20	20.8	0.1
14:21	20.8	0.1
14:22	20.8	0.1
14:23	20.8	0.1
14:24	20.8	0.1
14:25	20.8	0.1
14:26	20.8	0.1
Avgs	**20.8**	**0.1**

RUN SUMMARY

Number 3

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **27 Feb 2019**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 13:37 to 14:26

Run Averages

20.8	0.1

Pre-run Bias at 13:21

Zero Bias	0.1	0.0
Span Bias	12.0	8.4
Span Gas	12.0	8.9

Post-run Bias at 14:28

Zero Bias	0.1	0.0
Span Bias	12.0	8.4
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

20.9	0.2

BIAS AND CALIBRATION DRIFT

Number 4

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **27 Feb 2019**

Start Time: 14:28

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.5	Pass
Span	12.1	12.0	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.1	0.1	0.0	0.0	Pass
Span	12.0	12.0	0.0	0.0	Pass

*Bias No. 3

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.4	-0.2	-1.2	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.4	8.4	0.0	0.0	Pass

*Bias No. 3

BIAS AND CALIBRATION DRIFT

Number 5

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **28 Feb 2019**

Start Time: 07:19

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.1	11.8	-0.3	-1.4	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.1	0.0	-0.1	-0.5	Pass
Span	12.0	11.8	-0.2	-1.0	Pass

*Bias No. 4

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.6	8.3	-0.3	-1.8	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.1	0.1	0.6	Pass
Span	8.4	8.3	-0.1	-0.6	Pass

*Bias No. 4

RUN DATA

Number 4

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **28 Feb 2019**

Time	O_2 %	CO_2 %
08:14	20.6	0.1
08:15	20.6	0.1
08:16	20.6	0.1
08:17	20.6	0.1
08:18	20.6	0.1
08:19	20.6	0.1
08:20	20.6	0.1
08:21	20.6	0.1
08:22	20.6	0.1
	RUN 5 PORT 1	
08:23	20.6	0.1
08:24	20.6	0.1
08:25	20.6	0.1
08:26	20.6	0.1
08:27	20.6	0.1
08:28	20.6	0.1
08:29	20.6	0.1
08:30	20.6	0.1
08:31	20.6	0.1
08:32	20.6	0.1
08:33	20.6	0.1
08:34	20.6	0.1
08:35	20.6	0.1
08:36	20.6	0.1
08:37	20.6	0.1
08:38	20.6	0.1
08:39	20.6	0.1
08:40	20.6	0.1
08:41	20.6	0.1
08:42	20.6	0.1
08:43	20.6	0.1
08:44	20.6	0.1
08:45	20.6	0.1
08:46	20.6	0.1
08:47	20.6	0.1
08:48	20.6	0.1
08:49	20.6	0.1
08:50	20.6	0.1
08:51	20.6	0.1

RUN DATA

Number 4

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **28 Feb 2019**

Time	O_2 %	CO_2 %
08:52	20.6	0.1
08:53	20.6	0.1
08:54	20.6	0.1
08:55	20.6	0.1
08:56	20.6	0.1
08:57	20.6	0.1
08:58	20.6	0.1
08:59	20.6	0.1
09:00	20.6	0.1
09:01	20.6	0.1
09:02	20.6	0.1
09:03	20.6	0.1
09:04	20.6	0.1
09:05	20.6	0.1
09:06	20.6	0.1
09:07	20.7	0.1
09:08	20.7	0.1
09:09	20.7	0.1
09:10	20.7	0.1
09:11	20.7	0.1
PORT CHANGE		
09:12	20.7	0.1
09:13	20.7	0.1
09:14	20.7	0.1
09:15	20.7	0.1
09:16	20.6	0.1
09:17	20.6	0.1
09:18	20.6	0.1
09:19	20.6	0.1
09:20	20.6	0.1
09:21	20.6	0.1
09:22	20.6	0.1
09:23	20.6	0.1
09:24	20.6	0.1
09:25	20.6	0.1
09:26	20.6	0.1
09:27	20.6	0.1
09:28	20.6	0.1
09:29	20.6	0.1

RUN DATA

Number 4

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **28 Feb 2019**

Time	O_2 %	CO_2 %
	PORT 2	
09:30	20.6	0.1
09:31	20.6	0.1
09:32	20.6	0.1
09:33	20.6	0.1
09:34	20.6	0.2
09:35	20.6	0.2
09:36	20.6	0.2
09:37	20.6	0.2
09:38	20.6	0.2
09:39	20.6	0.2
09:40	20.6	0.2
09:41	20.7	0.2
09:42	20.7	0.2
09:43	20.7	0.2
09:44	20.7	0.2
09:45	20.7	0.2
09:46	20.7	0.2
09:47	20.7	0.2
09:48	20.7	0.2
09:49	20.7	0.2
09:50	20.7	0.2
09:51	20.7	0.2
09:52	20.7	0.2
09:53	20.7	0.2
09:54	20.7	0.2
09:55	20.7	0.2
09:56	20.7	0.1
09:57	20.8	0.1
09:58	20.8	0.1
09:59	20.8	0.1
10:00	20.8	0.1
10:01	20.8	0.1
10:02	20.8	0.1
10:03	20.8	0.1
10:04	20.8	0.1
10:05	20.8	0.1
10:06	20.8	0.1
10:07	20.8	0.1
10:08	20.8	0.1

RUN DATA

Number 4

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **28 Feb 2019**

Time	O_2 %	CO_2 %
10:09	20.8	0.1
10:10	20.8	0.1
10:11	20.8	0.1
10:12	20.8	0.1
10:13	20.8	0.1
10:14	20.8	0.1
10:15	20.8	0.1
10:16	20.8	0.1
10:17	20.8	0.1
10:18	20.8	0.1
Avgs	**20.7**	**0.1**

RUN SUMMARY

Number 4

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **28 Feb 2019**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 08:13 to 10:18

Run Averages

20.7	0.1

Pre-run Bias at 07:19

Zero Bias	0.0	0.1
Span Bias	11.8	8.3
Span Gas	12.0	8.9

Post-run Bias at 10:21

Zero Bias	0.0	0.0
Span Bias	12.0	8.3
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

20.8	0.1

BIAS AND CALIBRATION DRIFT

Number 6

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **28 Feb 2019**

Start Time: 10:21

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.1	12.0	-0.1	-0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	11.8	12.0	0.2	1.0	Pass

*Bias No. 5

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.3	-0.3	-1.8	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.1	0.0	-0.1	-0.6	Pass
Span	8.3	8.3	0.0	0.0	Pass

*Bias No. 5

RUN DATA

Number 5

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **28 Feb 2019**

Time	O_2 %	CO_2 %
14:12	20.6	0.1
14:13	20.6	0.1
14:14	20.6	0.1
14:15	20.6	0.1
14:16	20.6	0.1
14:17	20.6	0.1
14:18	20.6	0.1
14:19	20.6	0.1
14:20	20.6	0.1
14:21	20.6	0.1
14:22	20.6	0.1
14:23	20.6	0.1
14:24	20.6	0.1
14:25	20.6	0.1
14:26	20.6	0.1
14:27	20.6	0.1
14:28	20.6	0.1
	RUN 6	
	PORT 1	
14:29	20.6	0.1
14:30	20.5	0.2
14:31	20.5	0.4
14:32	20.5	0.2
14:33	20.6	0.2
14:34	20.6	0.1
14:35	20.6	0.1
14:36	20.6	0.1
14:37	20.6	0.1
14:38	20.6	0.1
14:39	20.6	0.1
14:40	20.6	0.1
14:41	20.6	0.1
14:42	20.6	0.1
14:43	20.6	0.1
14:44	20.6	0.1
14:45	20.6	0.1
14:46	20.6	0.1
14:47	20.6	0.1
14:48	20.6	0.1
14:49	20.6	0.1

RUN DATA

Number 5

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **28 Feb 2019**

Time	O_2 %	CO_2 %
14:50	20.6	0.1
14:51	20.6	0.1
14:52	20.6	0.1
14:53	20.6	0.1
14:54	20.6	0.1
14:55	20.6	0.1
14:56	20.6	0.1
14:57	20.6	0.1
14:58	20.6	0.1
14:59	20.6	0.1
15:00	20.6	0.1
15:01	20.6	0.1
15:02	20.6	0.1
15:03	20.6	0.1
15:04	20.6	0.1
15:05	20.6	0.1
15:06	20.6	0.1
15:07	20.6	0.1
15:08	20.6	0.1
15:09	20.6	0.1
15:10	20.6	0.1
15:11	20.6	0.1
15:12	20.6	0.1
15:13	20.7	0.1
15:14	20.7	0.1
15:15	20.7	0.1
15:16	20.7	0.1
15:17	20.7	0.1
PORT CHANGE		
15:18	20.7	0.1
15:19	20.6	0.1
15:20	20.6	0.1
15:21	20.6	0.1
15:22	20.6	0.1
15:23	20.6	0.1
15:24	20.6	0.1
15:25	20.6	0.1
15:26	20.6	0.1
15:27	20.6	0.1
15:28	20.6	0.1

RUN DATA

Number 5

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **28 Feb 2019**

Time	O_2 %	CO_2 %
15:29	20.6	0.1
15:30	20.6	0.1
15:31	20.6	0.1
15:32	20.6	0.1
15:33	20.6	0.1
15:34	20.6	0.1
15:35	20.6	0.1
15:36	20.6	0.1
15:37	20.6	0.1
15:38	20.6	0.1
	PORT 2	
15:39	20.6	0.1
15:40	20.6	0.1
15:41	20.6	0.1
15:42	20.6	0.1
15:43	20.6	0.1
15:44	20.6	0.1
15:45	20.6	0.1
15:46	20.6	0.1
15:47	20.6	0.1
15:48	20.7	0.1
15:49	20.7	0.1
15:50	20.7	0.1
15:51	20.7	0.1
15:52	20.7	0.1
15:53	20.7	0.1
15:54	20.7	0.1
15:55	20.7	0.1
15:56	20.7	0.1
15:57	20.7	0.1
15:58	20.7	0.1
15:59	20.7	0.1
16:00	20.7	0.1
16:01	20.7	0.1
16:02	20.7	0.1
16:03	20.7	0.1
16:04	20.7	0.1
16:05	20.7	0.1
16:06	20.7	0.1
16:07	20.7	0.1

RUN DATA

Number 5

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **28 Feb 2019**

Time	O_2 %	CO_2 %
16:08	20.7	0.1
16:09	20.7	0.1
16:10	20.7	0.1
16:11	20.7	0.1
16:12	20.7	0.1
16:13	20.7	0.1
16:14	20.7	0.1
16:15	20.7	0.1
16:16	20.7	0.1
16:17	20.7	0.1
16:18	20.7	0.1
16:19	20.7	0.1
16:20	20.7	0.1
16:21	20.7	0.1
16:22	20.7	0.1
16:23	20.7	0.1
16:24	20.7	0.1
16:25	20.7	0.1
16:26	20.7	0.1
16:27	20.7	0.1
Avgs	**20.6**	**0.1**

RUN SUMMARY

Number 5

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **28 Feb 2019**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 14:11 to 16:27

Run Averages

20.6	0.1

Pre-run Bias at 10:21

Zero Bias	0.0	0.0
Span Bias	12.0	8.3
Span Gas	12.0	8.9

Post-run Bias at 16:31

Zero Bias	0.0	0.0
Span Bias	11.9	8.4
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

20.7	0.1

BIAS AND CALIBRATION DRIFT

Number 7

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **28 Feb 2019**

Start Time: 16:31

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.1	11.9	-0.2	-1.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.0	11.9	-0.1	-0.5	Pass

*Bias No. 6

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.4	-0.2	-1.2	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.3	8.4	0.1	0.6	Pass

*Bias No. 6

BIAS AND CALIBRATION DRIFT

Number 8

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **1 Mar 2019**

Start Time: 07:24

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.1	12.2	0.1	0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	11.9	12.2	0.3	1.4	Pass

*Bias No. 7

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.3	-0.3	-1.8	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.4	8.3	-0.1	-0.6	Pass

*Bias No. 7

RUN DATA

Number 6

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **1 Mar 2019**

Time	O_2 %	CO_2 %
	RUN 7	
	PORT 1	
08:13	21.2	0.1
08:14	21.0	0.7
08:15	21.1	0.5
08:16	21.1	0.3
08:17	21.1	0.2
08:18	21.1	0.2
08:19	21.2	0.1
08:20	21.1	0.1
08:21	21.2	0.1
08:22	21.2	0.1
08:23	21.2	0.1
08:24	21.2	0.1
08:25	21.2	0.1
08:26	21.2	0.1
08:27	21.2	0.1
08:28	21.2	0.1
08:29	21.2	0.1
08:30	21.2	0.1
08:31	21.2	0.1
08:32	21.2	0.1
08:33	21.2	0.1
08:34	21.2	0.1
08:35	21.2	0.1
08:36	21.2	0.1
08:37	21.2	0.1
08:38	21.2	0.1
08:39	21.2	0.1
08:40	21.2	0.1
08:41	21.2	0.1
08:42	21.2	0.1
08:43	21.2	0.1
08:44	21.2	0.1
08:45	21.2	0.1
08:46	21.2	0.1
08:47	21.2	0.1
08:48	21.2	0.1
08:49	21.2	0.1
08:50	21.2	0.1

RUN DATA

Number 6

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **1 Mar 2019**

Time	O_2 %	CO_2 %
08:51	21.2	0.1
08:52	21.2	0.1
08:53	21.2	0.1
08:54	21.2	0.1
08:55	21.2	0.1
08:56	21.2	0.1
08:57	21.2	0.1
08:58	21.2	0.1
08:59	21.2	0.1
09:00	21.2	0.1
09:01	21.3	0.1
PORT CHANGE		
PORT 2		
09:20	21.2	0.1
09:21	21.2	0.1
09:22	21.2	0.1
09:23	21.2	0.2
09:24	21.2	0.2
09:25	21.2	0.2
09:26	21.2	0.2
09:27	21.2	0.2
09:28	21.2	0.2
09:29	21.2	0.2
09:30	21.2	0.2
09:31	21.3	0.2
09:32	21.3	0.2
09:33	21.3	0.2
09:34	21.3	0.2
09:35	21.3	0.2
09:36	21.3	0.2
09:37	21.3	0.2
09:38	21.3	0.2
09:39	21.3	0.2
09:40	21.3	0.2
09:41	21.3	0.2
09:42	21.3	0.1
09:43	21.3	0.1
09:44	21.3	0.1
09:45	21.3	0.1
09:46	21.3	0.1

RUN DATA

Number 6

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **1 Mar 2019**

Time	O_2 %	CO_2 %
09:47	21.3	0.1
09:48	21.3	0.1
09:49	21.3	0.1
09:50	21.3	0.1
09:51	21.3	0.1
09:52	21.3	0.1
09:53	21.3	0.1
09:54	21.3	0.1
09:55	21.3	0.1
09:56	21.3	0.1
09:57	21.3	0.1
09:58	21.3	0.1
09:59	21.3	0.1
10:00	21.3	0.1
10:01	21.3	0.1
10:02	21.3	0.1
10:03	21.3	0.1
10:04	21.3	0.1
10:05	21.3	0.1
10:06	21.3	0.1
10:07	21.3	0.1
10:08	21.3	0.1
Avgs	**21.2**	**0.1**

RUN SUMMARY

Number 6

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **1 Mar 2019**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 08:12 to 10:08

Run Averages

21.2	0.1

Pre-run Bias at 07:24

Zero Bias	0.0	0.0
Span Bias	12.2	8.3
Span Gas	12.0	8.9

Post-run Bias at 10:12

Zero Bias	0.0	0.0
Span Bias	12.2	8.4
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

20.9	0.1

BIAS AND CALIBRATION DRIFT

Number 9

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **1 Mar 2019**

Start Time: 10:12

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.1	12.2	0.1	0.5	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.2	12.2	0.0	0.0	Pass

*Bias No. 8

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.4	-0.2	-1.2	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.3	8.4	0.1	0.6	Pass

*Bias No. 8

RUN DATA

Number 7

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **1 Mar 2019**

Time	O_2 %	CO_2 %
	RUN 8	
	PORT 1	
12:37	21.1	0.1
12:38	21.1	0.1
12:39	21.1	0.1
12:40	21.1	0.1
12:41	21.1	0.1
12:42	21.1	0.1
12:43	21.1	0.1
12:44	21.1	0.1
12:45	21.1	0.1
12:46	21.1	0.1
12:47	21.1	0.1
12:48	21.1	0.1
12:49	21.1	0.1
12:50	21.1	0.1
12:51	21.1	0.1
12:52	21.1	0.1
12:53	21.1	0.1
12:54	21.1	0.1
12:55	21.1	0.1
12:56	21.1	0.1
12:57	21.1	0.1
12:58	21.1	0.1
12:59	21.1	0.1
13:00	21.1	0.1
13:01	21.1	0.1
13:02	21.1	0.1
13:03	21.1	0.1
13:04	21.1	0.1
13:05	21.1	0.1
13:06	21.1	0.1
13:07	21.1	0.1
13:08	21.1	0.1
13:09	21.1	0.1
13:10	21.2	0.1
13:11	21.2	0.1
13:12	21.2	0.1
13:13	21.2	0.1
13:14	21.2	0.1

RUN DATA

Number 7

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **1 Mar 2019**

Time	O_2 %	CO_2 %
13:15	21.2	0.1
13:16	21.2	0.1
13:17	21.2	0.1
13:18	21.2	0.1
13:19	21.2	0.1
13:20	21.2	0.1
13:21	21.2	0.1
13:22	21.2	0.1
13:23	21.2	0.1
13:24	21.3	0.1
PORT CHANGE		
PORT 2		
13:45	21.1	0.1
13:46	21.1	0.1
13:47	21.1	0.1
13:48	21.1	0.1
13:49	21.1	0.1
13:50	21.1	0.1
13:51	21.1	0.1
13:52	21.1	0.1
13:53	21.1	0.1
13:54	21.1	0.1
13:55	21.1	0.1
13:56	21.2	0.1
13:57	21.2	0.1
13:58	21.2	0.1
13:59	21.2	0.1
14:00	21.2	0.1
14:01	21.2	0.1
14:02	21.2	0.1
14:03	21.2	0.1
14:04	21.2	0.1
14:05	21.2	0.1
14:06	21.3	0.1
14:07	21.2	0.1
14:08	21.2	0.1
14:09	21.2	0.1
14:10	21.2	0.1
14:11	21.2	0.1
14:12	21.2	0.1

RUN DATA

Number 7

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **1 Mar 2019**

Time	O_2 %	CO_2 %
14:13	21.2	0.1
14:14	21.2	0.1
14:15	21.2	0.1
14:16	21.2	0.1
14:17	21.2	0.1
14:18	21.2	0.1
14:19	21.3	0.1
14:20	21.3	0.1
14:21	21.3	0.1
14:22	21.3	0.1
14:23	21.3	0.1
14:24	21.3	0.1
14:25	21.2	0.1
14:26	21.2	0.1
14:27	21.2	0.1
14:28	21.2	0.1
14:29	21.2	0.1
14:30	21.2	0.1
14:31	21.2	0.1
14:32	21.2	0.1
14:33	21.2	0.1
Avgs	**21.2**	**0.1**

RUN SUMMARY

Number 7

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **1 Mar 2019**

	O_2	CO_2
Method	EPA 3A	EPA 3A
Conc. Units	%	%

Time: 12:36 to 14:33

Run Averages

21.2	0.1

Pre-run Bias at 10:12

Zero Bias	0.0	0.0
Span Bias	12.2	8.4
Span Gas	12.0	8.9

Post-run Bias at 14:35

Zero Bias	0.0	0.0
Span Bias	12.1	8.3
Span Gas	12.0	8.9

Run averages corrected for the average of the pre-run and post-run bias

20.9	0.1

BIAS AND CALIBRATION DRIFT

Number 10

Client: **Chemours** Project Number: **15418.002.010**
Location: **CHEMOURS** Operator: **SD**
Source: **VE North Carbon Bed/Division** Calibration **1** Date: **1 Mar 2019**

Start Time: 14:35

O_2
Method: EPA 3A
Span Conc. 21.0 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.1	12.1	0.0	0.0	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	12.2	12.1	-0.1	-0.5	Pass

*Bias No. 9

CO_2
Method: EPA 3A
Span Conc. 16.6 %

Bias Results

Standard Gas	Cal. %	Bias %	Difference %	Error %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.6	8.3	-0.3	-1.8	Pass

Calibration Drift

Standard Gas	Initial* %	Final %	Difference %	Drift %	Status
Zero	0.0	0.0	0.0	0.0	Pass
Span	8.4	8.3	-0.1	-0.6	Pass

*Bias No. 9

APPENDIX C
LABORATORY ANALYTICAL REPORT

Note: The analytical report is included on the attached CD.

Client Sample ID: D-2422,2423 R1 DIV STACK CARBON BED INLET M0010 FH

Lab Sample ID: 140-14453-1

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	103		1.51	0.163	ug/Sample		03/04/19 13:06	03/08/19 12:46	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*108*	*D*	*50 - 200*	*03/04/19 13:06*	*03/08/19 12:46*	*10*

Client Sample ID: D-2424,2425,2427 R1 DIV STACK CARBON BED INLET M0010 BH

Lab Sample ID: 140-14453-2

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	2610		22.5	4.50	ug/Sample		03/04/19 05:45	03/08/19 14:51	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*76*	*D*	*50 - 200*	*03/04/19 05:45*	*03/08/19 14:51*	*100*

Client Sample ID: D-2426 R1 DIV STACK CARBON BED INLET M0010 IMP 1,2&3 COND

Lab Sample ID: 140-14453-3

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.120	J	0.190	0.00969	ug/Sample		03/06/19 06:51	03/08/19 13:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*85*		*50 - 200*	*03/06/19 06:51*	*03/08/19 13:29*	*1*

Client Sample ID: D-2428 R1 DIV STACK CARBON BED INLET M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-14453-4

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		03/04/19 05:45	03/08/19 14:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*20*	*X*	*50 - 200*	*03/04/19 05:45*	*03/08/19 14:54*	*1*

Client Sample ID: K-2056,2057 R1 DIV STACK CARBON BED OUTLET M0010 FH

Lab Sample ID: 140-14453-5

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	10.9		0.151	0.0163	ug/Sample		03/04/19 13:06	03/08/19 12:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*98*		*50 - 200*	*03/04/19 13:06*	*03/08/19 12:50*	*1*

Client Sample ID: K-2058,2059,2061 R1 DIV STACK CARBON BED OUTLET M0010 BH

Lab Sample ID: 140-14453-6

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	4.04		0.225	0.0450	ug/Sample		03/04/19 05:45	03/08/19 14:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*32*	*X*	*50 - 200*	*03/04/19 05:45*	*03/08/19 14:57*	*1*

Client Sample ID: K-2060 R1 DIV STACK CARBON BED OUTLET M0010 IMP 1,2&3 COND

Lab Sample ID: 140-14453-7

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.168	J	0.196	0.00999	ug/Sample		03/06/19 06:51	03/08/19 13:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*92*		*50 - 200*	*03/06/19 06:51*	*03/08/19 13:32*	*1*

Client Sample ID: K-2062 R1 DIV STACK CARBON BED OUTLET M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-14453-8

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		03/04/19 05:45	03/08/19 15:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*36*	*X*	*50 - 200*	*03/04/19 05:45*	*03/08/19 15:04*	*1*

Client Sample ID: H-2129,2130 R4 DIV STACK CARBON BED INLET M0010 FH

Lab Sample ID: 140-14453-17

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	51.4		1.01	0.109	ug/Sample		03/04/19 13:06	03/08/19 12:59	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*107*	*D*	*50 - 200*	*03/04/19 13:06*	*03/08/19 12:59*	*10*

Client Sample ID: H-2131,2132,2134 R4 DIV STACK CARBON BED INLET M0010 BH

Lab Sample ID: 140-14453-18

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1540		12.5	2.50	ug/Sample		03/04/19 05:54	03/08/19 15:56	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*74*	*D*	*50 - 200*	*03/04/19 05:54*	*03/08/19 15:56*	*50*

Client Sample ID: H-2133 R4 DIV STACK CARBON BED INLET M0010 IMP 1,2&3 COND

Lab Sample ID: 140-14453-19

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	118		2.10	0.107	ug/Sample		03/06/19 06:51	03/08/19 13:45	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*101*	*D*	*50 - 200*	*03/06/19 06:51*	*03/08/19 13:45*	*10*

Client Sample ID: H-2135 R4 DIV STACK CARBON BED INLET M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-14453-20

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1.77		0.200	0.0400	ug/Sample		03/04/19 05:54	03/08/19 15:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*21*	*X*	*50 - 200*	*03/04/19 05:54*	*03/08/19 15:59*	*1*

Client Sample ID: C-1229,1230 R4 DIV STACK CARBON BED OUTLET M0010 FH

Lab Sample ID: 140-14453-21

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	2.05		0.0765	0.00826	ug/Sample		03/04/19 13:06	03/08/19 13:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*94*		*50 - 200*	*03/04/19 13:06*	*03/08/19 13:02*	*1*

Client Sample ID: C-1231,1232,1234 R4 DIV STACK CARBON BED OUTLET M0010 BH

Lab Sample ID: 140-14453-22

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	318		2.75	0.550	ug/Sample		03/04/19 05:54	03/08/19 16:02	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*63*	*D*	*50 - 200*	*03/04/19 05:54*	*03/08/19 16:02*	*10*

Client Sample ID: C-1233 R4 DIV STACK CARBON BED OUTLET M0010 IMP 1,2&3 COND

Lab Sample ID: 140-14453-23

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.204	0.0104	ug/Sample		03/06/19 06:51	03/08/19 13:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*93*		*50 - 200*	*03/06/19 06:51*	*03/08/19 13:52*	*1*

Client Sample ID: C-1235 R4 DIV STACK CARBON BED OUTLET M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-14453-24

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		03/04/19 05:54	03/08/19 16:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*20*	*X*	*50 - 200*	*03/04/19 05:54*	*03/08/19 16:06*	*1*

Client Sample ID: D-2429,2430 R3 DIV STACK CARBON BED INLET M0010 FH

Lab Sample ID: 140-14459-1

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	51.3		1.01	0.109	ug/Sample		03/07/19 09:38	03/11/19 13:10	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*121*	*D*	*50 - 200*	*03/07/19 09:38*	*03/11/19 13:10*	*10*

Client Sample ID: D-2431,,2432,2434 R3 DIV STACK CARBON BED INLET M0010 BH

Lab Sample ID: 140-14459-2

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1430		12.5	2.50	ug/Sample		03/06/19 08:09	03/18/19 10:22	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*101*	*D*	*50 - 200*	*03/06/19 08:09*	*03/18/19 10:22*	*50*

Client Sample ID: D-2433 R3 DIV STACK CARBON BED INLET M0010 IMP 1,2&3 COND

Lab Sample ID: 140-14459-3

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	38.4		0.408	0.0208	ug/Sample		03/06/19 11:22	03/11/19 12:02	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*132*	*D*	*50 - 200*	*03/06/19 11:22*	*03/11/19 12:02*	*2*

Client Sample ID: D-2435 R3 DIV STACK CARBON BED INLET M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-14459-4

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1.89		0.200	0.0400	ug/Sample		03/06/19 08:09	03/18/19 10:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*60*		*50 - 200*	*03/06/19 08:09*	*03/18/19 10:25*	*1*

Client Sample ID: K-2063,2064 R3 DIV STACK CARBON BED OUTLET M0010 FH

Lab Sample ID: 140-14459-5

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	5.76		0.101	0.0109	ug/Sample		03/07/19 09:38	03/11/19 13:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*126*		*50 - 200*	*03/07/19 09:38*	*03/11/19 13:14*	*1*

Client Sample ID: K-2065,2066,2068 R3 DIV STACK CARBON BED OUTLET M0010 BH

Lab Sample ID: 140-14459-6

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1.33		0.250	0.0500	ug/Sample		03/06/19 08:09	03/18/19 10:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*21*	*X*	*50 - 200*	*03/06/19 08:09*	*03/18/19 10:28*	*1*

Client Sample ID: K-2067 R3 DIV STACK CARBON BED OUTLET M0010 IMP 1,2&3 COND

Lab Sample ID: 140-14459-7

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.204	0.0104	ug/Sample		03/06/19 11:22	03/11/19 12:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*118*		*50 - 200*	*03/06/19 11:22*	*03/11/19 12:05*	*1*

Client Sample ID: K-2069 R3 DIV STACK CARBON BED OUTLET M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-14459-8

Date Collected: 02/27/19 00:00
Matrix: Air
Date Received: 02/27/19 16:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		03/06/19 08:09	03/18/19 10:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*20*	*X*	*50 - 200*	*03/06/19 08:09*	*03/18/19 10:32*	*1*

Client Sample ID: H-2122,2123 DIV STACK CB INLET M0010 R2 FH 230 KG/HR

Lab Sample ID: 140-14464-1

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	55.5		1.26	0.136	ug/Sample		03/04/19 13:06	03/08/19 13:06	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*89*	*D*	*50 - 200*	*03/04/19 13:06*	*03/08/19 13:06*	*10*

Client Sample ID: H-2124,2125,2127 DIV STACK CB INLET M0010 R2 BH 230 KG/HR

Lab Sample ID: 140-14464-2

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	3140		20.0	4.00	ug/Sample		03/04/19 05:45	03/08/19 15:20	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*79*	*D*	*50 - 200*	*03/04/19 05:45*	*03/08/19 15:20*	*100*

Client Sample ID: H-2126 DIV STACK CB INLET M0010 R2 IMP 1,2&3 COND 230 KG/HR

Lab Sample ID: 140-14464-3

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	24.0		0.204	0.0104	ug/Sample		03/06/19 06:51	03/08/19 14:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*82*		*50 - 200*	*03/06/19 06:51*	*03/08/19 14:08*	*1*

Client Sample ID: H-2128 DIV STACK CB INLET M0010 R2 BREAKTHROUGH XAD-2 RESIN TUBE 230 KG/HR

Lab Sample ID: 140-14464-4

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	7.68		0.200	0.0400	ug/Sample		03/04/19 05:45	03/08/19 15:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*40*	*X*	*50 - 200*	*03/04/19 05:45*	*03/08/19 15:23*	*1*

Client Sample ID: C-1222,1223 DIV STACK CB OUTLET M0010 R2 FH 230 KG/HR

Lab Sample ID: 140-14464-5

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	4.20		0.126	0.0136	ug/Sample		03/04/19 13:06	03/08/19 13:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*102*		*50 - 200*	*03/04/19 13:06*	*03/08/19 13:09*	*1*

Client Sample ID: C-1224,1225,1227 DIV STACK CB OUTLET M0010 R2 BH 230 KG/HR

Lab Sample ID: 140-14464-6

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.380		0.225	0.0450	ug/Sample		03/04/19 05:54	03/08/19 15:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*41*	*X*	*50 - 200*	*03/04/19 05:54*	*03/08/19 15:33*	*1*

Client Sample ID: C-1226 DIV STACK CB OUTLET M0010 R2 IMP 1,2&3 COND 230 KG/HR

Lab Sample ID: 140-14464-7

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0952	J	0.208	0.0106	ug/Sample		03/06/19 06:51	03/08/19 14:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*96*		*50 - 200*	*03/06/19 06:51*	*03/08/19 14:11*	*1*

Client Sample ID: C-1228 DIV STACK CB OUTLET M0010 R2 BREAKTHROUGH XAD-2 RESIN TUBE 230 KG/HR

Lab Sample ID: 140-14464-8

Date Collected: 02/26/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		03/04/19 05:54	03/08/19 15:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*38*	*X*	*50 - 200*	*03/04/19 05:54*	*03/08/19 15:39*	*1*

Client Sample ID: E-1684,1685 DIV STACK CB INLET M0010 R6 FH 150 KG/HR

Lab Sample ID: 140-14464-17

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	41.4		0.251	0.0271	ug/Sample		03/07/19 09:38	03/11/19 13:23	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*122*	*D*	*50 - 200*	*03/07/19 09:38*	*03/11/19 13:23*	*2*

Client Sample ID: E-1686,1687,1689 DIV STACK CB INLET M0010 R6 BH 150 KG/HR

Lab Sample ID: 140-14464-18

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1510		10.0	2.00	ug/Sample		03/06/19 08:09	03/18/19 10:54	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*94*	*D*	*50 - 200*	*03/06/19 08:09*	*03/18/19 10:54*	*50*

Client Sample ID: E-1688 DIV STACK CB INLET M0010 R6 IMP 1,2&3 COND 150 KG/HR

Lab Sample ID: 140-14464-19

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	150		1.98	0.101	ug/Sample		03/06/19 06:51	03/08/19 14:21	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*114*	*D*	*50 - 200*	*03/06/19 06:51*	*03/08/19 14:21*	*10*

Client Sample ID: E-1690 DIV STACK CB INLET M0010 R6 IMP BREAKTHROUGH XAD-2 RESIN TUBE 2 150 KG/HR

Lab Sample ID: 140-14464-20

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.709		0.200	0.0400	ug/Sample		03/06/19 08:09	03/18/19 10:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*49*	*X*	*50 - 200*	*03/06/19 08:09*	*03/18/19 10:58*	*1*

Client Sample ID: E-1691,1692 DIV STACK CB INLET M0010 R8 FH 150 KG/HR

Lab Sample ID: 140-14464-21

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	38.5		0.503	0.0543	ug/Sample		03/07/19 09:38	03/11/19 13:27	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*117*	*D*	*50 - 200*	*03/07/19 09:38*	*03/11/19 13:27*	*5*

Client Sample ID: E-1693,1694,1696 DIV STACK CB INLET M0010 R8 BH 150 KG/HR

Lab Sample ID: 140-14464-22

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	957		10.0	2.00	ug/Sample		03/11/19 09:29	03/15/19 11:57	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*106*	*D*	*50 - 200*	*03/11/19 09:29*	*03/15/19 11:57*	*50*

Client Sample ID: E-1695 DIV STACK CB INLET M0010 R8 IMP 1,2&3 COND 150 KG/HR

Lab Sample ID: 140-14464-23

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	62.4		1.01	0.0515	ug/Sample		03/06/19 06:51	03/08/19 14:28	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*116*	*D*	*50 - 200*	*03/06/19 06:51*	*03/08/19 14:28*	*5*

Client Sample ID: E-1697 DIV STACK CB INLET M0010 R8 BREAKTHROUGH XAD-2 RESIN TUBE 150 KG/HR

Lab Sample ID: 140-14464-24

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1.09		0.200	0.0400	ug/Sample		03/11/19 09:29	03/15/19 12:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*67*		*50 - 200*	*03/11/19 09:29*	*03/15/19 12:00*	*1*

Client Sample ID: D-2084,2085 DIV STACK CB OUTLET M0010 R6 FH 150 KG/HR

Lab Sample ID: 140-14464-25

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1.94		0.126	0.0136	ug/Sample		03/07/19 09:38	03/11/19 13:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*117*		*50 - 200*	*03/07/19 09:38*	*03/11/19 13:30*	*1*

Client Sample ID: D-2086,2087,2089 DIV STACK CB OUTLET M0010 R6 BH 150 KG/HR

Lab Sample ID: 140-14464-26

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.250	0.0500	ug/Sample		03/06/19 08:09	03/18/19 11:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*30*	*X*	*50 - 200*	*03/06/19 08:09*	*03/18/19 11:01*	*1*

Client Sample ID: D-2088 DIV STACK CB OUTLET M0010 R6 IMP 1,2&3 COND 150 KG/HR

Lab Sample ID: 140-14464-27

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.210	0.0107	ug/Sample		03/06/19 06:51	03/08/19 14:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*95*		*50 - 200*	*03/06/19 06:51*	*03/08/19 14:31*	*1*

Client Sample ID: D-2090 DIV STACK CB OUTLET M0010 R6 BREAKTHROUGH XAD-2 RESIN TUBE 150 KG/HR

Lab Sample ID: 140-14464-28

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		03/06/19 08:09	03/18/19 11:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*27*	*X*	*50 - 200*	*03/06/19 08:09*	*03/18/19 11:04*	*1*

Client Sample ID: D-2091,2092 DIV STACK CB OUTLET M0010 R8 FH 150 KG/HR

Lab Sample ID: 140-14464-29

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1.44		0.0760	0.00821	ug/Sample		03/07/19 09:38	03/11/19 13:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*131*		*50 - 200*	*03/07/19 09:38*	*03/11/19 13:33*	*1*

Client Sample ID: D-2093,2094,2096 DIV STACK CB OUTLET M0010 R8 BH 150 KG/HR

Lab Sample ID: 140-14464-30

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.300	0.0600	ug/Sample		03/11/19 09:29	03/15/19 12:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*33*	*X*	*50 - 200*	*03/11/19 09:29*	*03/15/19 12:03*	*1*

Client Sample ID: D-2095 DIV STACK CB OUTLET M0010 R8 IMP 1,2&3 COND 150 KG/HR

Lab Sample ID: 140-14464-31

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.210	0.0107	ug/Sample		03/06/19 06:51	03/08/19 14:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*94*		*50 - 200*	*03/06/19 06:51*	*03/08/19 14:34*	*1*

Client Sample ID: D-2097 DIV STACK CB OUTLET M0010 R8 BREAKTHROUGH XAD-2 RESIN TUBE 150 KG/HR

Lab Sample ID: 140-14464-32

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		03/11/19 09:29	03/15/19 12:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*27*	*X*	*50 - 200*	*03/11/19 09:29*	*03/15/19 12:07*	*1*

Client Sample ID: R-2150,2151 R5 DIV CARBON BED INLET M0010 FH

Lab Sample ID: 140-14468-1

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	44.4		1.02	0.110	ug/Sample		03/07/19 09:38	03/11/19 14:03	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*123*	*D*	*50 - 200*	*03/07/19 09:38*	*03/11/19 14:03*	*10*

Client Sample ID: R-2152,2153,2155 R5 DIV CARBON BED INLET M0010 BH

Lab Sample ID: 140-14468-2

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1480		12.5	2.50	ug/Sample		03/11/19 09:29	03/15/19 12:55	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*93*	*D*	*50 - 200*	*03/11/19 09:29*	*03/15/19 12:55*	*50*

Client Sample ID: R-2154 R5 DIV CARBON BED INLET M0010 IMP 1,2&3 COND

Lab Sample ID: 140-14468-3

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	13.3		0.196	0.00999	ug/Sample		03/06/19 11:22	03/11/19 12:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*113*		*50 - 200*	*03/06/19 11:22*	*03/11/19 12:22*	*1*

Client Sample ID: R-2156 R5 DIV CARBON BED INLET M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-14468-4

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	2.92		0.200	0.0400	ug/Sample		03/11/19 09:29	03/15/19 13:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*33*	*X*	*50 - 200*	*03/11/19 09:29*	*03/15/19 13:02*	*1*

Client Sample ID: R-2157,2158 R7 DIV CARBON BED INLET M0010 FH

Lab Sample ID: 140-14468-5

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	52.3		1.26	0.136	ug/Sample		03/07/19 09:38	03/11/19 14:06	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*128*	*D*	*50 - 200*	*03/07/19 09:38*	*03/11/19 14:06*	*10*

Client Sample ID: R-2159,2160,2162 R7 DIV CARBON BED INLET M0010 BH

Lab Sample ID: 140-14468-6

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1380		12.5	2.50	ug/Sample		03/11/19 09:29	03/15/19 13:05	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*92*	*D*	*50 - 200*	*03/11/19 09:29*	*03/15/19 13:05*	*50*

Client Sample ID: R-2161 R7 DIV CARBON BED INLET M0010 IMP 1,2&3 COND

Lab Sample ID: 140-14468-7

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	10.2		0.210	0.0107	ug/Sample		03/06/19 11:22	03/11/19 12:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*106*		*50 - 200*	*03/06/19 11:22*	*03/11/19 12:25*	*1*

Client Sample ID: R-2163 R7 DIV CARBON BED INLET M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-14468-8

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1.55		0.200	0.0400	ug/Sample		03/12/19 03:08	03/15/19 09:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*23*	*X*	*50 - 200*	*03/12/19 03:08*	*03/15/19 09:35*	*1*

Client Sample ID: G-2150,2151 R5 DIV CARBON BED OUTLET M0010 FH

Lab Sample ID: 140-14468-9

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1.30		0.101	0.0109	ug/Sample		03/07/19 09:38	03/11/19 14:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*124*		*50 - 200*	*03/07/19 09:38*	*03/11/19 14:09*	*1*

Client Sample ID: G-2152,2153,2155 R5 DIV CARBON BED OUTLET M0010 BH

Lab Sample ID: 140-14468-10

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.275	0.0550	ug/Sample		03/12/19 03:08	03/15/19 09:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*36*	*X*	*50 - 200*	*03/12/19 03:08*	*03/15/19 09:38*	*1*

Client Sample ID: G-2154 R5 DIV CARBON BED OUTLET M0010 IMP 1,2&3 COND

Lab Sample ID: 140-14468-11

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.210	0.0107	ug/Sample		03/06/19 11:22	03/11/19 12:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*112*		*50 - 200*	*03/06/19 11:22*	*03/11/19 12:31*	*1*

Client Sample ID: G-2156 R5 DIV CARBON BED OUTLET M0010 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-14468-12

Date Collected: 02/28/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		03/12/19 03:08	03/15/19 09:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*33*	*X*	*50 - 200*	*03/12/19 03:08*	*03/15/19 09:41*	*1*

Client Sample ID: G-2157,2158 R7 DIV CARBON BED OUTLET M0010 FH
Lab Sample ID: 140-14468-13

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	1.22		0.0765	0.00826	ug/Sample		03/07/19 09:38	03/11/19 14:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*121*		*50 - 200*	*03/07/19 09:38*	*03/11/19 14:12*	*1*

Client Sample ID: G-2159,2160,2162 R7 DIV CARBON BED OUTLET M0010 BH
Lab Sample ID: 140-14468-14

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.300	0.0600	ug/Sample		03/12/19 03:08	03/15/19 09:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*33*	*X*	*50 - 200*	*03/12/19 03:08*	*03/15/19 09:45*	*1*

Client Sample ID: G-2161 R7 DIV CARBON BED OUTLET M0010 IMP 1,2&3 COND
Lab Sample ID: 140-14468-15

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - HFPO-DA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.210	0.0107	ug/Sample		03/06/19 11:22	03/11/19 12:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*112*		*50 - 200*	*03/06/19 11:22*	*03/11/19 12:35*	*1*

Client Sample ID: G-2163 R7 DIV CARBON BED OUTLET M0010 BREAKTHROUGH XAD-2 RESIN TUBE
Lab Sample ID: 140-14468-16

Date Collected: 03/01/19 00:00
Matrix: Air
Date Received: 03/02/19 09:30
Sample Container: Air Train

Method: 8321A - PFOA and PFOS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.200	0.0400	ug/Sample		03/12/19 03:08	03/15/19 09:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C3 HFPO-DA	*27*	*X*	*50 - 200*	*03/12/19 03:08*	*03/15/19 09:48*	*1*

Default Detection Limits

Client: Chemours Company FC, LLC The
Job ID: 140-14453-1
Project/Site: Carbon Bed Inlet and Carbon Bed Outlet

Method: 8321A - HFPO-DA

Prep: None

Analyte	RL	MDL	Units
HFPO-DA	0.00250	0.00128	ug/Sample

Method: 8321A - PFOA and PFOS

Prep: None

Analyte	RL	MDL	Units
HFPO-DA	0.0250	0.00270	ug/Sample
HFPO-DA	0.100	0.0200	ug/Sample

APPENDIX D
SAMPLE CALCULATIONS

SAMPLE CALCULATIONS FOR
HFPO DIMER ACID (METHOD 0010)

Client: Chemours | **Plant: Fayetteville, NC**
Test Number: Run 1 | **Test Date: 2/26/2019**
Test Location: CBed Inlet | **Test Period: 0927-1143**

1. HFPO Dimer Acid concentration, lbs/dscf.

$$Conc1 = \frac{W \times 2.2046 \times 10^{-9}}{Vm(std)}$$

$$Conc1 = \frac{2713.1 \times 2.2046 \times 10\text{-}9}{54.721}$$

Conc1 = 1.09E-07

Where:

W = Weight of HFPO Dimer Acid collected in sample in ug

Conc1 = HFPO Dimer Acid concentration, lbs/dscf.

2.2046×10^{-9} = Conversion factor from ug to lbs.

2. HFPO Dimer Acid concentration, ug/dscm.

Conc2 = W / (Vm(std) x 0.02832)

Conc2 = 2713.1 / (54.721 x 0.02832)

Conc2 = 1750.6

Where:

Conc2 = HFPO Dimer Acid concentration, ug/dscm.

0.02832 = Conversion factor from cubic feet to cubic meters.

3. HFPO Dimer Acid mass emission rate, lbs/hr.

$MR1_{(Inlet)}$ = Conc1 x Qs(std) x 60 min/hr

$MR1_{(Inlet)}$ = 1.09E-07 x 15187 x 60

$MR1_{(Inlet)}$ = 9.96E-02

Where:

$MR1_{(Inlet)}$ = HFPO Dimer Acid mass emission rate, lbs/hr.

4. HFPO Dimer Acid mass emission rate, g/sec.

$MR2_{(Inlet)}$ = $MR1_{(Inlet)}$ x 453.59 / 3600

$MR2_{(Inlet)}$ = 9.96E-02 x 453.59 /3600

$MR2_{(Inlet)}$ = 1.25E-02

Where:

$MR2_{(Inlet)}$ = HFPO Dimer Acid mass emission rate, g/sec.

453.59 = Conversion factor from pounds to grams.

3600 = Conversion factor from hours to seconds.

5. HFPO Dimer Acid Removal Efficiency, %

$$RE = \frac{MR1_{(Inlet)} - MR1_{(Outlet)}}{MR1_{(Inlet)}}$$

$$RE = \frac{(9.96E\text{-}02) - (5.530E\text{-}04)}{9.96E\text{-}02}$$

RE = 99.4

Where:

RE = Carbon Bed Removal Efficiency.

$MR1_{(Inlet)}$ = Carbon Bed Inlet HFPO Dimer Acid mass rate, lbs/hr.

$MR1_{(Outlet)}$ = Carbon Bed Outlet HFPO Dimer Acid mass rate, lbs/hr.

EXAMPLE CALCULATIONS FOR VOLUMETRIC FLOW AND MOISTURE AND ISOKINETICS

Client: Chemours	Facility: Fayetteville, NC
Test Number: Run 1	Test Date: 2/26/19
Test Location: VEN-Carbon Bed Inlet	Test Period: 0927-1143

1. Volume of dry gas sampled at standard conditions (68 deg F, 29.92 in. Hg), dscf.

$$Vm(std) = \frac{17.64 \times Y \times Vm \times \left(Pb + \frac{delta\ H}{13.6} \right)}{(Tm + 460)}$$

$$Vm(std) = \frac{17.64 \times 1.0027 \times 52.809 \times \left(30.29 + \frac{1.329}{13.6} \right)}{58.71 + 460} = 54.721$$

Where:

Vm(std) =	Volume of gas sample measured by the dry gas meter, corrected to standard conditions, dscf.
Vm =	Volume of gas sample measured by the dry gas meter at meter conditions, dcf.
Pb =	Barometric Pressure, in Hg.
delt H =	Average pressure drop across the orifice meter, in H_2O
Tm =	Average dry gas meter temperature , deg F.
Y =	Dry gas meter calibration factor.
17.64 =	Factor that includes ratio of standard temperature (528 deg R) to standard pressure (29.92 in. Hg), deg R/in. Hg.
13.6 =	Specific gravity of mercury.

2. Volume of water vapor in the gas sample corrected to standard conditions, scf.

$$Vw(std) = (0.04707 \times Vwc) + (0.04715 \times Wwsg)$$

$$Vw(std) = (0.04707 \times 13.5) + (0.04715 \times 11.2) = 1.16$$

Where:

Vw(std) =	Volume of water vapor in the gas sample corrected to standard conditions, scf.
Vwc =	Volume of liquid condensed in impingers, ml.
Wwsg =	Weight of water vapor collected in silica gel, g.
0.04707 =	Factor which includes the density of water (0.002201 lb/ml), the molecular weight of water (18.0 lb/lb-mole), the ideal gas constant 21.85 (in. Hg) (ft^3)/lb-mole)(deg R); absolute temperature at standard conditions (528 deg R), absolute pressure at standard conditions (29.92 in. Hg), ft^3/ml.
0.04715 =	Factor which includes the molecular weight of water (18.0 lb/lb-mole), the ideal gas constant 21.85 (in. Hg) (ft^3)/lb-mole)(deg R); absolute temperature at standard conditions (528 deg R), absolute pressure at standard conditions (29.92 in. Hg), and 453.6 g/lb, ft^3/g.

3. Moisture content

$$bws = \frac{Vw(std)}{Vw(std) + Vm(std)}$$

$$bws = \frac{1.16}{1.16 + 54.721} = 0.021$$

Where:

bws = Proportion of water vapor, by volume, in the gas stream, dimensionless.

4. Mole fraction of dry gas.

Md = 1 - bws

Md = 1 - 0.021 = 0.979

Where:

Md = Mole fraction of dry gas, dimensionless.

5. Dry molecular weight of gas stream, lb/lb-mole.

MWd = (0.440 x % CO_2) + (0.320 x % O_2) + (0.280 x (% N_2 + % CO))

MWd = (0.440 x 0.0) + (0.320 x 20.9) + (0.280 x (79.1 + 0.00))

MWd = 28.84

Where:

MWd = Dry molecular weight , lb/lb-mole.
% CO2 = Percent carbon dioxide by volume, dry basis.
% O_2 = Percent oxygen by volume, dry basis.
% N_2 = Percent nitrogen by volume, dry basis.
% CO = Percent carbon monoxide by volume, dry basis.
0.440 = Molecular weight of carbon dioxide, divided by 100.
0.320 = Molecular weight of oxygen, divided by 100.
0.280 = Molecular weight of nitrogen or carbon monoxide, divided by 100.

6. Actual molecular weight of gas stream (wet basis), lb/lb-mole.

MWs = (MWd x Md) + (18 x (1 - Md))

MWs = (28.84 x 0.979) +(18 (1 - 0.979)) = 28.61

Where:

MWs = Molecular weight of wet gas, lb/lb-mole.
18 = Molecular weight of water, lb/lb-mole.

7. Average velocity of gas stream at actual conditions, ft/sec.

$$Vs = 85.49 \times Cp \times ((\text{delt } p)^{1/2})avg \times \left(\frac{Ts\ (avg)}{Ps \times MWs} \right)^{1/2}$$

$$Vs = 85.49 \times 0.84 \times 0.72952 \times \left(\frac{529}{29.81 \times 28.61} \right)^{\wedge}1/2 = 41.3$$

Where:

Vs = Average gas stream velocity, ft/sec.

85.49 = Pitot tube constant, ft/sec x $\frac{(lb/lb\text{-}mole)(in.\ Hg)^{1/2}}{(deg\ R)(in\ H_2O)}$

Cp = Pitot tube coefficient, dimensionless.

Ts = Absolute gas stream temperature, deg R = Ts, deg F + 460.

Ps = Absolute gas stack pressure, in. Hg. = Pb + $\frac{P(static)}{13.6}$

delt p = Velocity head of stack, in. H_2O.

8. Average gas stream volumetric flow rate at actual conditions, wacf/min.

$$Qs(act) = 60 \times Vs \times As$$

$$Qs(act) = 60 \times 41.3 \times 6.31 = 15613$$

Where:

Qs(act) = Volumetric flow rate of wet stack gas at actual conditions, wacf/min.

As = Cross-sectional area of stack, ft^2.

60 = Conversion factor from seconds to minutes.

9. Average gas stream dry volumetric flow rate at standard conditions, dscf/min.

$$Qs(std) = 17.64 \times Md \times \frac{Ps}{Ts} \times Qs(act)$$

$$Qs(std) = 17.64 \times 0.979 \times \frac{29.81}{529.4} \times 15613$$

$$Qs(std) = 15187$$

Where:

Qs(std) = Volumetric flow rate of dry stack gas at standard conditions, dscf/min.

10. Isokinetic variation calculated from intermediate values, percent.

$$I = \frac{17.327 \times Ts \times Vm(std)}{Vs \times O \times Ps \times Md \times (Dn)^2}$$

$$I = \frac{17.327 \times 529 \times 54.721}{41.3 \times 96 \times 29.81 \times 0.979 \times (0.215)^{\wedge}2} = 93.9$$

Where:

I =	Percent of isokinetic sampling.
O =	Total sampling time, minutes.
Dn =	Diameter of nozzle, inches.
17.327 =	Factor which includes standard temperature (528 deg R), standard pressure (29.92 in. Hg), the formula for calculating area of circle $D^{2}/4$, conversion of square feet to square inches (144), conversion of seconds to minutes (60), and conversion to percent (100), $\frac{(\text{in. Hg})(\text{in}^2)(\text{min})}{(\text{deg R})(\text{ft}^2)(\text{sec})}$

APPENDIX E
EQUIPMENT CALIBRATION RECORDS

INTERFERENCE CHECK

Date: 12/4/14-12/5/14
Analyzer Type: Servomex - O_2
Model No: 4900
Serial No: 49000-652921
Calibration Span: 21.09 %
Pollutant: 21.09% O_2 - CC418692

INTERFERENT GAS	ANALYZER RESPONSE		% OF CALIBRATION SPAN[(a)]
	INTERFERENT GAS RESPONSE (%)	INTERFERENT GAS RESPONSE, WITH BACKGROUND POLLUTANT (%)	
CO_2 (30.17% CC199689)	0.00	-0.01	0.00
NO (445 ppm CC346681)	0.00	0.02	0.11
NO_2 (23.78 ppm CC500749)	NA	NA	NA
N_2O (90.4 ppm CC352661)	0.00	0.05	0.24
CO (461.5 ppm XC006064B)	0.00	0.02	0.00
SO_2 (451.2 ppm CC409079)	0.00	0.05	0.23
CH_4 (453.1 ppm SG901795)	NA	NA	NA
H_2 (552 ppm ALM048043)	0.00	0.09	0.44
HCl (45.1 ppm CC17830)	0.00	0.03	0.14
NH_3 (9.69 ppm CC58181)	0.00	0.01	0.03
TOTAL INTERFERENCE RESPONSE			**1.20**
METHOD SPECIFICATION			**< 2.5%**

[(a)] The larger of the absolute values obtained for the interferent tested with and without the pollutant present was used in summing the interferences.

Chad Walker

INTERFERENCE CHECK

Date: 12/4/14-12/5/14
Analyzer Type: Servomex - CO_2
Model No: 4900
Serial No: 49000-652921
Calibration Span: 16.65%
Pollutant: 16.65% CO_2 - CC418692

INTERFERENT GAS	ANALYZER RESPONSE		% OF CALIBRATION SPAN[(a)]
	INTERFERENT GAS RESPONSE (%)	INTERFERENT GAS RESPONSE, WITH BACKGROUND POLLUTANT (%)	
CO_2 (30.17% CC199689)	NA .	NA	NA
NO (445 ppm CC346681)	0.00	0.02	0.10
NO_2 (23.78 ppm CC500749)	0.00	0.00	0.02
N_2O (90.4 ppm CC352661)	0.00	0.01	0.04
CO (461.5 ppm XC006064B)	0.00	0.01	0.00
SO_2 (451.2 ppm CC409079)	0.00	0.11	0.64
CH_4 (453.1 ppm SG901795)	0.00	0.07	0.44
H_2 (552 ppm ALM048043)	0.00	0.04	0.22
HCl (45.1 ppm CC17830)	0.10	0.06	0.60
NH_3 (9.69 ppm CC58181)	0.00	0.02	0.14
TOTAL INTERFERENCE RESPONSE			**2.19**
METHOD SPECIFICATION			**< 2.5%**

[(a)] The larger of the absolute values obtained for the interferent tested with and without the pollutant present was used in summing the interferences.

Chad Walker

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI79E15A00E4	Reference Number:	82-401288926-1
Cylinder Number:	CC18055	Cylinder Volume:	150.5 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52018	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Sep 04, 2018

Expiration Date: Sep 04, 2026

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	9.000 %	8.864 %	G1	+/- 0.7% NIST Traceable	09/04/2018
OXYGEN	12.00 %	12.00 %	G1	+/- 0.4% NIST Traceable	09/04/2018
NITROGEN	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060629	CC413730	13.359 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	May 09, 2019

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA 510-CO2-19GYCXEG	NDIR	Aug 09, 2018
Horiba MPA 510-O2-7TWMJ041	Paramagnetic	Aug 09, 2018

Triad Data Available Upon Request

Signature on file
Approved for Release

150

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
600 Union Landing Road
Cinnaminson, NJ 08077-0000
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI62E15A0224	Reference Number:	82-401044874-1
Cylinder Number:	SG9169108	Cylinder Volume:	157.2 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52017	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Nov 18, 2017

Expiration Date: Nov 18, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	17.00 %	16.58 %	G1	+/- 0.7% NIST Traceable	11/18/2017
OXYGEN	21.00 %	21.00 %	G1	+/- 0.5% NIST Traceable	11/18/2017
NITROGEN	Balance			-	

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12061336	CC360792	11.002 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 11, 2018
NTRM	09061415	CC273526	22.53 % OXYGEN/NITROGEN	+/- 0.4%	Mar 08, 2019

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba VIA 510-CO2-19GYCXEG	NDIR	Oct 30, 2017
Horiba MPA 510-O2-7TWMJ041	Paramagnetic	Oct 27, 2017

Triad Data Available Upon Request

Signature on file
Approved for Release

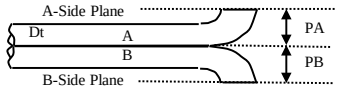
Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-694**

Inspection Date 2/19/19 Individual Conducting Inspection ks

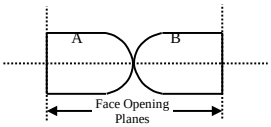
If all Criteria PASS
Cp is equal to 0.84

		PASS/FAIL
Distance to A Plane (PA) - inches	0.46	PASS
Distance to B Plane (PB) - inches	0.46	PASS
Pitot OD (D_t) - inches	0.375	

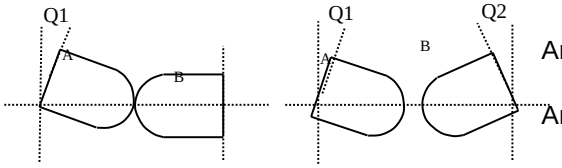


$1.05\ D_t < P < 1.5\ D_t$

PA must Equal PB



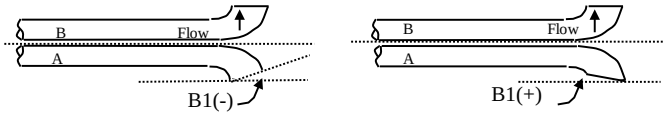
Are Open Faces Aligned Perpendicular to the Tube Axis: (●) YES ( ) NO — PASS



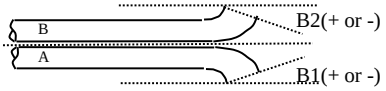
Angle of Q1 from vertical A Tube- degrees (absolute) 0 PASS

Angle of Q2 from vertical B Tube- degrees (absolute) 0 PASS

Q1 and Q2 must be $\leq 10^o$



Angle of B1 from vertical A Tube- degrees (absolute) 0 PASS

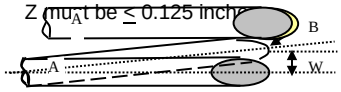


Angle of B1 from vertical B Tube- degrees (absolute) 0 PASS

B1 or B2 must be $\leq 5^o$

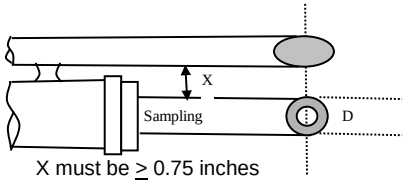
Horizontal offset between A and B Tubes (Z) - inches 0.004 PASS

Z must be $\leq$ 0.125 inches



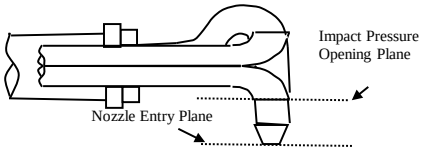
Vertical offset between A and B Tubes (W) - inches 0.015 PASS

W must be $\leq$ 0.03125 inches

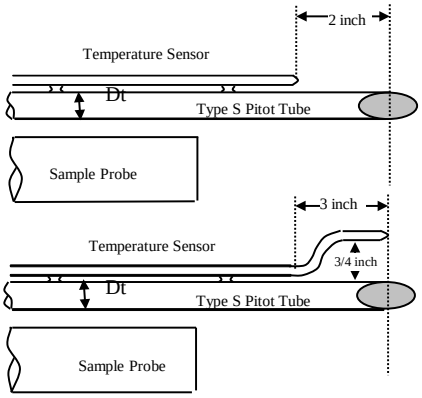


Distance between Sample Nozzle and Pitot (X) - inches 0.8 PASS

X must be $\geq$ 0.75 inches



Impact Pressure Opening Plane is above the Nozzle Entry Plane: (●) YES ( ) NO ( ) NA



Thermocouple meets the Distance Criteria in the adjacent figure: (●) YES ( ) NO ( ) NA

Thermocouple meets the Distance Criteria in the adjacent figure: ( ) YES ( ) NO (●) NA

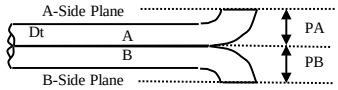
Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-710**

Inspection Date 2/19/19 Individual Conducting Inspection ks

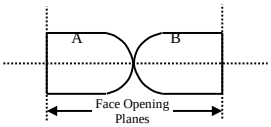
If all Criteria PASS Cp is equal to 0.84

		PASS/FAIL
Distance to A Plane (PA) - inches	0.453	PASS
Distance to B Plane (PB) - inches	0.453	PASS
Pitot OD (D_t) - inches	0.375	

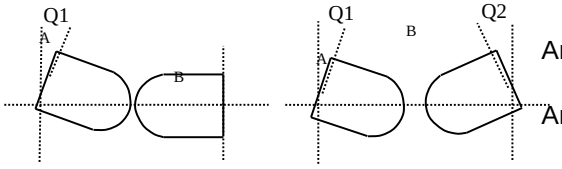


$1.05\ D_t < P < 1.5\ D_t$

PA must Equal PB



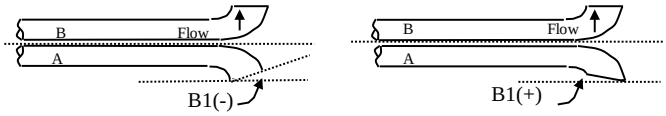
Are Open Faces Aligned Perpendicular to the Tube Axis: (●) YES ( ) NO — PASS



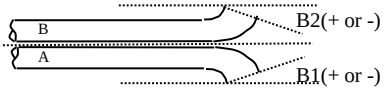
Angle of Q1 from vertical A Tube- degrees (absolute) 0 PASS

Angle of Q2 from vertical B Tube- degrees (absolute) 0 PASS

Q1 and Q2 must be $\leq 10^o$



Angle of B1 from vertical A Tube- degrees (absolute) 0 PASS

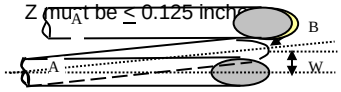


Angle of B1 from vertical B Tube- degrees (absolute) 0 PASS

B1 or B2 must be $\leq 5^o$

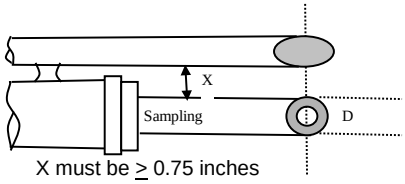
Horizontal offset between A and B Tubes (Z) - inches 0.012 PASS

Z must be $\leq$ 0.125 inches



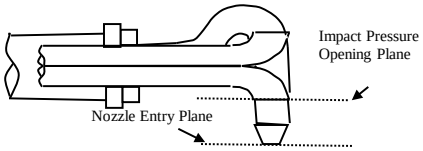
Vertical offset between A and B Tubes (W) - inches 0.022 PASS

W must be $\leq$ 0.03125 inches

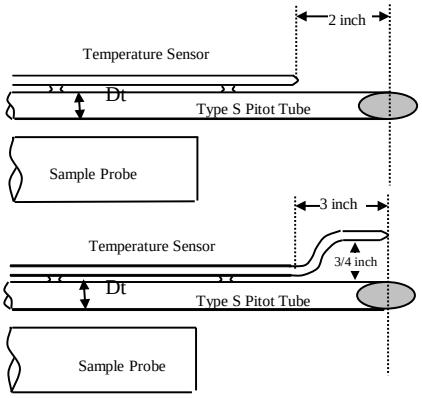


Distance between Sample Nozzle and Pitot (X) - inches 0.87 PASS

X must be $\geq$ 0.75 inches



Impact Pressure Opening Plane is above the Nozzle Entry Plane: (●) YES ( ) NO ( ) NA



Thermocouple meets the Distance Criteria in the adjacent figure: (●) YES ( ) NO ( ) NA

Thermocouple meets the Distance Criteria in the adjacent figure: ( ) YES ( ) NO (●) NA

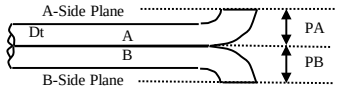
Type S Pitot Tube Inspection Data Form

Pitot Tube Identification Number: **P-706**

Inspection Date 2/19/19 Individual Conducting Inspection KS

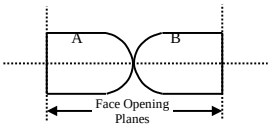
If all Criteria PASS
Cp is equal to 0.84

		PASS/FAIL
Distance to A Plane (PA) - inches	0.45	PASS
Distance to B Plane (PB) - inches	0.45	PASS
Pitot OD (D_t) - inches	0.375	

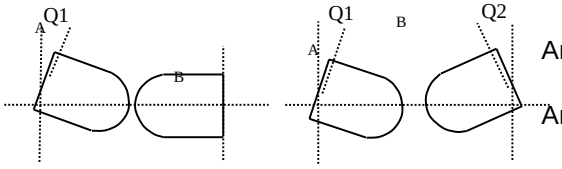


$1.05\ D_t < P < 1.5\ D_t$

PA must Equal PB



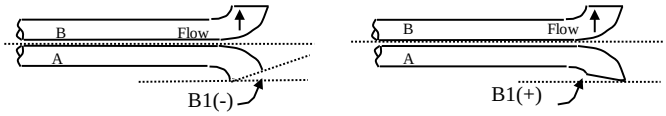
Are Open Faces Aligned Perpendicular to the Tube Axis: (●) YES ( ) NO — PASS



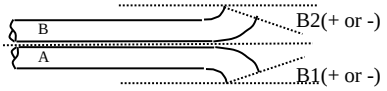
Angle of Q1 from vertical A Tube- degrees (absolute) 0 PASS

Angle of Q2 from vertical B Tube- degrees (absolute) 0 PASS

Q1 and Q2 must be $\leq 10^o$



Angle of B1 from vertical A Tube- degrees (absolute) 0 PASS

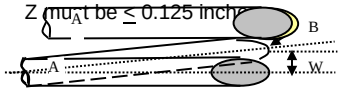


Angle of B1 from vertical B Tube- degrees (absolute) 0 PASS

B1 or B2 must be $\leq 5^o$

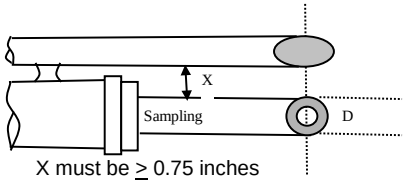
Horizontal offset between A and B Tubes (Z) - inches 0.006 PASS

Z must be $\leq$ 0.125 inches



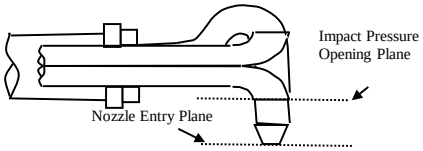
Vertical offset between A and B Tubes (W) - inches 0.012 PASS

W must be $\leq$ 0.03125 inches

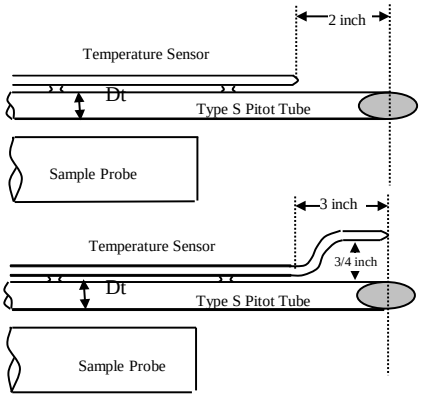


Distance between Sample Nozzle and Pitot (X) - inches 0.79 PASS

X must be $\geq$ 0.75 inches



Impact Pressure Opening Plane is above the Nozzle Entry Plane: (●) YES ( ) NO ( ) NA



Thermocouple meets the Distance Criteria in the adjacent figure: (●) YES ( ) NO ( ) NA

Thermocouple meets the Distance Criteria in the adjacent figure: ( ) YES ( ) NO (●) NA

Y Factor Calibration Check Calculation

MODIFIED METHOD 0010 TEST TRAIN

CARBON BED INLET

METER BOX NO. 28

2/26/2019 - 2/28/2019 & 3/1/2019

	Run 1	Run 2	Run 3
MWd = Dry molecular weight source gas, lb/lb-mole.			
0.32 = Molecular weight of oxygen, divided by 100.			
0.44 = Molecular weight of carbon dioxide, divided by 100.			
0.28 = Molecular weight of nitrogen or carbon monoxide, divided by 100.			
% CO_2 = Percent carbon dioxide by volume, dry basis.	0.0	0.0	0.0
% O_2 = Percent oxygen by volume, dry basis.	20.9	20.9	20.9

$$MWd = (0.32 * O_2) + (0.44 * CO_2) + (0.28 * (100 - (CO_2 + O_2)))$$

$$MWd = (0.32 * 20.9) + (0.44 * 0) + (0.28 * (100 - (0 + 20.9)))$$

$$MWd = (6.69) + (0.00) + (22.15)$$

MWd =	28.84	28.84	28.84

Tma = Source Temperature, absolute(^{o}R)			
Tm = Average dry gas meter temperature , deg F.	58.7	74.0	60.2

$$Tma = Ts + 460$$

$$Tma = 58.71 + 460$$

Tma =	518.71	533.96	520.17

Ps = Absolute meter pressure, inches Hg.			
13.60 = Specific gravity of mercury.			
delta H = Avg pressure drop across the orifice meter during sampling, in H2O	1.33	1.31	1.27
Pb = Barometric Pressure, in Hg.	30.29	30.20	30.22

$$Pm = Pb + (delta\ H / 13.6)$$

$$Pm = 30.29 + (1.32916666666667 / 13.6)$$

Pm =	30.39	30.30	30.31

Yqa = dry gas meter calibration check value, dimensionless.			
0.03 = (29.92/528)(0.75)2 (in. Hg/°/R) cfm2.			
29.00 = dry molecular weight of air, lb/lb-mole.			
Vm = Volume of gas sample measured by the dry gas meter at meter conditions, dcf.	52.809	56.260	55.079
Y = Dry gas meter calibration factor (based on full calibration)	1.0027	1.0027	1.0027
Delta H@ = Dry Gas meter orifice calibration coefficient, in. H2O.	2.0895	2.0895	2.0895
avg SQRT Delta H = Avg SQRT press. drop across the orifice meter during sampling , in. H_2O	1.1497	1.1436	1.1235
O = Total sampling time, minutes.	96	96	96

$$Yqa = (O / Vm) * SQRT (0.0319 * Tma * 29) / (Delta\ H@ * Pm * MWd) * avg\ SQRT\ Delta\ H$$

$$Yqa = (96.00 / 52.81) * SQRT (0.0319 * 518.71 * 29) / (2.09 * 30.39 * 28.84) * 1.15$$

$$Yqa = 1.818 * SQRT 479.857 / 1,831.083 * 1.15$$

Yqa =	1.070	1.015	1.005

Diff = Absolute difference between Yqa and Y	6.71	1.23	0.23

$$Diff = ((Y - Yqa) / Y) * 100$$

$$Diff = ((1.0027 - 1.070) / 1.0027) * 100$$

Average Diff = 2.72

Allowable = 5.0

Y Factor Calibration Check Calculation

MODIFIED METHOD 0010 TEST TRAIN

CARBON BED OUTLET

METER BOX NO. WC22

2/26/2019 - 2/28/2019 & 3/1/2019

	Run 1	Run 2	Run 3
MWd = Dry molecular weight source gas, lb/lb-mole.			
0.32 = Molecular weight of oxygen, divided by 100.			
0.44 = Molecular weight of carbon dioxide, divided by 100.			
0.28 = Molecular weight of nitrogen or carbon monoxide, divided by 100.			
% CO_2 = Percent carbon dioxide by volume, dry basis.	0.0	0.0	0.0
% O_2 = Percent oxygen by volume, dry basis.	20.9	20.9	20.9

$$MWd = (0.32 * O_2) + (0.44 * CO_2) + (0.28 * (100 - (CO_2 + O_2)))$$

$$MWd = (0.32 * 20.9) + (0.44 * 0) + (0.28 * (100 - (0 + 20.9)))$$

$$MWd = (6.69) + (0.00) + (22.15)$$

MWd =	28.84	28.84	28.84

Tma = Source Temperature, absolute(^{o}R)			
Tm = Average dry gas meter temperature , deg F.	60.2	79.4	63.3

$$Tma = Ts + 460$$

$$Tma = 60.21 + 460$$

Tma =	520.21	539.38	523.25

Ps = Absolute meter pressure, inches Hg.			
13.60 = Specific gravity of mercury.			
delta H = Avg pressure drop across the orifice meter during sampling, in H2O	1.61	1.65	1.64
Pb = Barometric Pressure, in Hg.	30.29	30.20	30.22

$$Pm = Pb + (delta\ H / 13.6)$$

$$Pm = 30.29 + (1.60791666666667 / 13.6)$$

Pm =	30.41	30.32	30.34

Yqa = dry gas meter calibration check value, dimensionless.			
0.03 = (29.92/528)(0.75)2 (in. Hg/°/R) cfm2.			
29.00 = dry molecular weight of air, lb/lb-mole.			
Vm = Volume of gas sample measured by the dry gas meter at meter conditions, dcf.	54.493	55.964	55.596
Y = Dry gas meter calibration factor (based on full calibration)	1.0010	1.0010	1.0010
Delta H@ = Dry Gas meter orifice calibration coefficient, in. H2O.	2.4674	2.4674	2.4674
avg SQRT Delta H = Avg SQRT press. drop across the orifice meter during sampling , in. H_2O	1.2420	1.2604	1.2575
O = Total sampling time, minutes.	96	96	96

$$Yqa = (O / Vm) * SQRT (0.0319 * Tma * 29) / (Delta\ H@ * Pm * MWd) * avg\ SQRT\ Delta\ H$$

$$Yqa = (96.00 / 54.49) * SQRT (0.0319 * 520.21 * 29) / (2.47 * 30.41 * 28.84) * 1.24$$

$$Yqa = 1.762 * SQRT 481.245 / 2,163.670 * 1.24$$

Yqa =	1.0319	1.0398	1.0283

Diff = Absolute difference between Yqa and Y	3.09	3.88	2.73

$$Diff = ((Y - Yqa) / Y) * 100$$

$$Diff = ((1.001 - 1.032) / 1.001) * 100$$

Average Diff = 3.23

Allowable = 5.0

APPENDIX F
LIST OF PROJECT PARTICIPANTS

The following WESTON employees participated in this project.

Paul Meeter	Senior Project Manager
Jeff O'Neill	Team Member
Robert Scroggins	Team Member
Jacob Little	Team Member
Kris Ansley	Team Member
Austin Squires	Team Member