



Source Test Report

The Chemours Company
22828 Highway 87W
Fayetteville, NC 28306

Source Tested: Semiworks Carbon Bed
Adsorber

Test Date: May 5, 2021

AST Project No. 2021-13240

Prepared By
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Regulatory Information

Permit No. Title V Air Permit No. 03735T48

Source Information

Source Name
Semiworks Carbon Bed Adsorber

Target Parameter
HFPO-DA

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Alliance Source Testing, LLC (AST) has completed the source testing as described in this report. Results apply only to the source(s) tested and operating condition(s) for the specific test date(s) and time(s) identified within this report. All results are intended to be considered in their entirety, and AST is not responsible for use of less than the complete test report without written consent. This report shall not be reproduced in full or in part without written approval from the customer.

To the best of my knowledge and abilities, all information, facts and test data are correct. Data presented in this report has been checked for completeness and is accurate, error-free and legible. Onsite testing was conducted in accordance with approved internal Standard Operating Procedures. Any deviations or problems are detailed in the relevant sections on the test report.

This report is only considered valid once an authorized representative of AST has signed in the space provided below; any other version is considered draft. This document was prepared in portable document format (.pdf) and contains pages as identified in the bottom footer of this document.



7/16/2021

Patrick Grady, QSTI
Project Manager/Field Team Leader
Alliance Source Testing, LLC

Date

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Introduction

1.0 Introduction

Alliance Source Testing, LLC (AST) was retained by Ramboll Americas Engineering Solutions, Inc. (Ramboll) to conduct compliance testing at The Chemours Company (Chemours) facility located in Fayetteville, North Carolina. The facility operates under Chemours’ Title V Air Permit No. 03735T48. Testing was conducted to determine the emission rate of hexafluoro-propylene oxide-dimer acid (HFPO-DA) from the Semiworks carbon bed adsorber.

1.1 Source and Control System Descriptions

The Nafion™ Semiworks produces polymerization initiators and Nafion™ fluoropolymers. Process streams are vented to a carbon bed and exhausted to atmosphere through a 35 ½ inch stack.

1.2 Project Team

Personnel involved in this project are identified in the following table.

**Table 1-1
Project Team**

Facility Personnel	Christel Compton
DAQ Personnel	Gary Saunders
Ramboll Personnel	Chase Forman
AST Personnel	Patrick Grady Antonio Anderson Brian Goodhile Steven Milo Jeffrey Sheldon

Summary of Results

2.0 Summary of Results

AST conducted compliance testing at the Chemours facility in Fayetteville, North Carolina on May 5, 2021. Testing consisted of determining the emission rate of hexafluoro-propylene oxide-dimer acid (HFPO-DA) from the semiworks carbon bed adsorber.

Table 2-1 provides a summary of the emission testing results. Any difference between the summary results listed in the following table and the detailed results contained in appendices is due to rounding for presentation.

**Table 2-1
Summary of Results**

Run Number	Run 1	Run 2	Run 3	Average
Date	5/5/21	5/5/21	5/5/21	--
HFPO-DA Data				
Outlet Emission Rate, lb/hr	5.0E-04	2.5E-03	7.3E-04	1.3E-03
Inlet Emission Rate, lb/hr	1.1E-03	6.2E-03	1.7E-03	3.0E-03
Reduction Efficiency, %	55.6	58.9	57.3	57.3

Testing Methodology

3.0 Testing Methodology

The emission testing program was conducted in accordance with the test methods listed in Table 3-1. Method descriptions are provided below while quality assurance/quality control data is provided in Appendix D.

Table 3-1
Source Testing Methodology

Parameter	U.S. EPA Reference Test Methods	Notes/Remarks
Volumetric Flow Rate	1 & 2	Full Velocity Traverses
Moisture Content	4	Volumetric / Gravimetric Analysis
HFPO-DA	OTM-45	Isokinetic Sampling

3.1 U.S. EPA Reference Test Methods 1 and 2 – Sampling/Traverse Points and Volumetric Flow Rate

The sampling location and number of traverse (sampling) points were selected in accordance with U.S. EPA Reference Test Method 1. To determine the minimum number of traverse points, the upstream and downstream distances were equated into equivalent diameters and compared to Figure 1-1 in U.S. EPA Reference Test Method 1.

Full velocity traverses were conducted in accordance with U.S. EPA Reference Test Method 2 to determine the average stack gas velocity pressure, static pressure and temperature. The velocity and static pressure measurement system consisted of a pitot tube and inclined manometer. The stack gas temperature was measured with a K-type thermocouple and pyrometer.

The O₂ and CO₂ concentration were assumed to be ambient for molecular weight and volumetric flow rate calculations.

3.2 U.S. EPA Reference Test Method 4 – Moisture Content

The stack gas moisture content was determined in accordance with U.S. EPA Reference Test Method 4. The gas conditioning train consisted of a series of chilled impingers. Prior to testing, each impinger was filled with a known quantity of water or silica gel. Each impinger was analyzed gravimetrically before and after each test run on the same balance to determine the amount of moisture condensed.

3.3 U.S. EPA Other Test Method (OTM) 45 - HFPO-DA

HFPO-DA emissions were evaluated in accordance with Other Test Method (OTM) 45. The sample train consisted of a borosilicate glass nozzle attached directly to a heated borosilicate glass-lined probe. The probe was connected directly to a heated borosilicate glass filter holder containing a solvent-extracted glass fiber filter. In order to minimize possible thermal degradation of the HFPO-DA, the probe and particulate filter were heated to just above stack temperature to minimize water vapor condensation before the filter. The filter holder exit was connected to a water-cooled coil condenser followed by a water-cooled sorbent module containing approximately 40 grams of XAD-2 resin. The XAD-2 inlet temperature was monitored to ensure that the module is maintained at a temperature below 20°C.

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

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

3.4 HFPO-DA Sample Train and Equipment Preparation

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

1. Wash all glassware, brushes, and ancillary tools with low residue soap and hot water.
2. Rinse all glassware, brushes, and ancillary tools three (3) times with D.I. H₂O.
3. Bake glassware (with the exception of probe liners) at 450°C for approximately 2 hours, (XAD-2 resin tube glassware is cleaned by Eurofins/TestAmerica by this same procedure).
4. Solvent rinse three (3) times all glassware, brushes, and ancillary tools with the following sequence of solvents: acetone, methylene chloride, hexane, and methanol.
5. Clean glassware and tools will be sealed in plastic bags or aluminum foil for transport to the sampling site.
6. Squirt bottles will be new dedicated bottles of known history and dedicated to the D.I. Water and methanol/ammonium hydroxide (MeOH/ 5% NH₄OH) solvent contents. Squirt bottles will be labelled with the solvent content it contains.

3.5 HFPO-DA Sample Train Recovery

Following completion of each test run, the sample probe, nozzle and front-half of the filter holder were brushed and rinsed three times each with the MeOH/ 5% NH₄OH solution (Container #1). The glass fiber filter was removed from its housing and transferred to a polyethylene bottle (Container #2). Any particulate matter and filter fibers which adhered to the filter holder and gasket were also placed in Container #2. The XAD-2 resin trap was sealed, labelled and placed in an iced sample cooler. The back-half of the filter holder, coil condenser condensate trap and connecting glassware were rinsed with the same MeOH/ 5% NH₄OH solution and placed in Container #3.

The volume of water collected in the second and third impingers was measured for moisture determinations and then placed in Container #4. Impingers #2 and #3 were then rinsed with the MeOH/ 5% NH₄OH solution and placed in Container #5. The second (breakthrough) XAD-2 resin trap was sealed, labelled and placed in an iced sample cooler. The second condensate trap was rinsed with the MeOH/ 5% NH₄OH solution and placed in Container #5. The contents of the fifth impinger were placed in its original container and weighed for moisture determinations.

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

Appendix A

Location: Ramboll - Chemours Fayetteville Works Facility, NC
 Source: Semiworks Carbon Bed Outlet
 Project No.: 2021-13240
 Run No.: 1
 Parameter: HFPO-DA

Meter Pressure (Pm), in. Hg

$$P_m = P_b + \frac{\Delta H}{13.6}$$

where,

$P_b \frac{29.85}{\text{in. Hg}}$ = barometric pressure, in. Hg
 $\Delta H \frac{2.104}{\text{in. H}_2\text{O}}$ = pressure differential of orifice, in H₂O
 $P_m \frac{30.00}{\text{in. Hg}}$ = in. Hg

Absolute Stack Gas Pressure (Ps), in. Hg

$$P_s = P_b + \frac{P_g}{13.6}$$

where,

$P_b \frac{29.85}{\text{in. Hg}}$ = barometric pressure, in. Hg
 $P_g \frac{-0.15}{\text{in. H}_2\text{O}}$ = static pressure, in. H₂O
 $P_s \frac{29.84}{\text{in. Hg}}$ = in. Hg

Standard Meter Volume (Vmstd), dscf

$$V_{mstd} = \frac{17.636 \times Y \times V_m \times P_m}{T_m}$$

where,

$Y \frac{0.992}{\text{dimensionless}}$ = meter correction factor
 $V_m \frac{81.593}{\text{cf}}$ = meter volume, cf
 $P_m \frac{30.00}{\text{in. Hg}}$ = absolute meter pressure, in. Hg
 $T_m \frac{550.6}{\text{°R}}$ = absolute meter temperature, °R
 $V_{mstd} \frac{77.785}{\text{dscf}}$ = dscf

Standard Wet Volume (Vwstd), scf

$$V_{wstd} = 0.04716 \times V_{lc}$$

where,

$V_{lc} \frac{23.6}{\text{ml}}$ = volume of H₂O collected, ml
 $V_{wstd} \frac{1.113}{\text{scf}}$ = scf

Moisture Fraction (BWSsat), dimensionless (theoretical at saturated conditions)

$$BWS_{sat} = \frac{10^{6.37 - \left(\frac{2,827}{T_s + 365}\right)}}{P_s}$$

where,

$T_s \frac{82.3}{\text{°F}}$ = stack temperature, °F
 $P_s \frac{29.84}{\text{in. Hg}}$ = absolute stack gas pressure, in. Hg
 $BWS_{sat} \frac{0.037}{\text{dimensionless}}$ = dimensionless

Moisture Fraction (BWS), dimensionless (measured)

$$BWS = \frac{V_{wstd}}{(V_{wstd} + V_{mstd})}$$

where,

$V_{wstd} \frac{1.113}{\text{scf}}$ = standard wet volume, scf
 $V_{mstd} \frac{77.785}{\text{dscf}}$ = standard meter volume, dscf
 $BWS \frac{0.014}{\text{dimensionless}}$ = dimensionless

Location: Ramboll - Chemours Fayetteville Works Facility, NC
 Source: Semiworks Carbon Bed Outlet
 Project No.: 2021-13240
 Run No.: 1
 Parameter: HFPO-DA

Moisture Fraction (BWS), dimensionless

$$BWS = BWSmsd \text{ unless } BWSsat < BWSmsd$$

where,

$$BWSsat \frac{0.037}{0.014} = \text{moisture fraction (theoretical at saturated conditions)}$$

$$BWSmsd \frac{0.014}{0.014} = \text{moisture fraction (measured)}$$

$$BWS \frac{0.014}{0.014}$$

Molecular Weight (DRY) (Md), lb/lb-mole

$$Md = (0.44 \times \% CO_2) + (0.32 \times \% O_2) + (0.28 (100 - \% CO_2 - \% O_2))$$

where,

$$CO_2 \frac{0.1}{20.9} = \text{carbon dioxide concentration, \%}$$

$$O_2 \frac{20.9}{28.85} = \text{oxygen concentration, \%}$$

$$Md \frac{28.85}{28.85} = \text{lb/lb mol}$$

Molecular Weight (WET) (Ms), lb/lb-mole

$$Ms = Md (1 - BWS) + 18.015 (BWS)$$

where,

$$Md \frac{28.85}{28.70} = \text{molecular weight (DRY), lb/lb mol}$$

$$BWS \frac{0.014}{28.70} = \text{moisture fraction, dimensionless}$$

$$Ms \frac{28.70}{28.70} = \text{lb/lb mol}$$

Average Velocity (Vs), ft/sec

$$Vs = 85.49 \times Cp \times (\Delta P^{1/2})_{avg} \times \sqrt{\frac{Ts}{Ps \times Ms}}$$

where,

$$Cp \frac{0.840}{0.675} = \text{pitot tube coefficient}$$

$$\Delta P^{1/2} \frac{0.675}{542.0} = \text{velocity head of stack gas, (in. H}_2\text{O)}^{1/2}$$

$$Ts \frac{542.0}{29.84} = \text{absolute stack temperature, } ^\circ\text{R}$$

$$Ps \frac{29.84}{28.70} = \text{absolute stack gas pressure, in. Hg}$$

$$Ms \frac{28.70}{38.5} = \text{molecular weight of stack gas, lb/lb mol}$$

$$Vs \frac{38.5}{38.5} = \text{ft/sec}$$

Average Stack Gas Flow at Stack Conditions (Qa), acfm

$$Qa = 60 \times Vs \times As$$

where,

$$Vs \frac{38.5}{6.87} = \text{stack gas velocity, ft/sec}$$

$$As \frac{6.87}{15,896} = \text{cross-sectional area of stack, ft}^2$$

$$Qa \frac{15,896}{15,896} = \text{acfm}$$

Average Stack Gas Flow at Standard Conditions (Qs), dscfm

$$Qs = 17.636 \times Qa \times (1 - BWS) \times \frac{Ps}{Ts}$$

where,

$$Qa \frac{15,896}{15,217} = \text{average stack gas flow at stack conditions, acfm}$$

$$BWS \frac{0.014}{29.84} = \text{moisture fraction, dimensionless}$$

$$Ps \frac{29.84}{542.0} = \text{absolute stack gas pressure, in. Hg}$$

$$Ts \frac{542.0}{15,217} = \text{absolute stack temperature, } ^\circ\text{R}$$

$$Qs \frac{15,217}{15,217} = \text{dscfm}$$

Location: Ramboll - Chemours Fayetteville Works Facility, NC
Source: Semiworks Carbon Bed Outlet
Project No.: 2021-13240
Run No.: 1
Parameter: HFPO-DA

Dry Gas Meter Calibration Check (Yqa), dimensionless

$$Yqa = \frac{Y - \left(\frac{\Theta}{V_m} \sqrt{\frac{0.0319 \times T_m \times 29}{\Delta H@ \times \left(P_b + \frac{\Delta H_{avg.}}{13.6} \right) \times M_d}} \sqrt{\Delta H_{avg.}} \right)}{Y} \times 100$$

where,

Y	<u>0.992</u>	= meter correction factor, dimensionless
Θ	<u>96</u>	= run time, min.
V_m	<u>81.593</u>	= total meter volume, cf
T_m	<u>550.6</u>	= absolute meter temperature, °R
$\Delta H@$	<u>1.65</u>	= orifice meter calibration coefficient, in. H ₂ O
P_b	<u>29.85</u>	= barometric pressure, in. Hg
ΔH_{avg}	<u>2.104</u>	= average pressure differential of orifice, in H ₂ O
M_d	<u>28.85</u>	= molecular weight (DRY), lb/lb mol
$(\Delta H)^{1/2}$	<u>1.449</u>	= average squareroot pressure differential of orifice, (in. H ₂ O) ^{1/2}
Yqa	<u>-2.6</u>	= dimensionless

Volume of Nozzle (Vn), ft³

$$V_n = \frac{T_s}{P_s} \left(0.002669 \times V_{lc} + \frac{V_m \times P_m \times Y}{T_m} \right)$$

where,

T_s	<u>542.0</u>	= absolute stack temperature, °R
P_s	<u>29.84</u>	= absolute stack gas pressure, in. Hg
V_{lc}	<u>23.6</u>	= volume of H ₂ O collected, ml
V_m	<u>81.593</u>	= meter volume, cf
P_m	<u>30.00</u>	= absolute meter pressure, in. Hg
Y	<u>0.992</u>	= meter correction factor, unitless
T_m	<u>550.6</u>	= absolute meter temperature, °R
V_n	<u>81.253</u>	= volume of nozzle, ft ³

Isokinetic Sampling Rate (I), %

$$I = \left(\frac{V_n}{\theta \times 60 \times A_n \times V_s} \right) \times 100$$

where,

V_n	<u>81.253</u>	= nozzle volume, ft ³
θ	<u>96.0</u>	= run time, minutes
A_n	<u>0.00037</u>	= area of nozzle, ft ²
V_s	<u>38.5</u>	= average velocity, ft/sec
I	<u>97.8</u>	= %

Location: Ramboll - Chemours Fayetteville Works Facility, NC
 Source: Semiworks Carbon Bed Outlet
 Project No.: 2021-13240
 Run No.: 1
 Parameter: HFPO-DA

HFPO-DA Concentration (C_{HFPODA}), ng/dscm

$$C_{HPFODA} = \frac{M_n \times 35.31}{Vmstd}$$

where,

$$M_n \frac{19,329.2}{8.8E+03} = \text{HFPO-DA mass, ng}$$

$$Vmstd \frac{77.785}{8.8E+03} = \text{standard meter volume, dscf}$$

$$C_{(HFPODA)} \frac{8.8E+03}{8.8E+03} = \text{ng/dscm}$$

HFPO-DA Emission Rate (PMR), lb/hr

$$PMR = \frac{C_s \times Q_s \times 60}{7.0E + 03}$$

where,

$$C_{(HFPODA)} \frac{8.8E+03}{15,217} = \text{HFPO-DA concentration, ng/dscm}$$

$$Q_s \frac{15,217}{5.0E-04} = \text{average stack gas flow at standard conditions, dscfm}$$

$$ER_{(HFPODA)} \frac{5.0E-04}{5.0E-04} = \text{lb/hr}$$

Appendix B

Location Ramboll - Chemours Fayetteville Works Facility, NC
Source Semiworks Carbon Bed Outlet
Project No. 2021-13240
Parameter HFPO-DA

Run Number		Run 1	Run 2	Run 3	Average
Date		5/5/21	5/5/21	5/5/21	--
Start Time		11:12	14:05	16:52	--
Stop Time		1:14	16:04	18:48	--
Run Time, min	(θ)	96.0	96.0	96.0	96.0
INPUT DATA					
Barometric Pressure, in. Hg	(Pb)	29.85	29.85	29.85	29.85
Meter Correction Factor	(Y)	0.992	0.992	0.992	0.992
Orifice Calibration Value	($\Delta H @$)	1.650	1.650	1.650	1.650
Meter Volume, ft ³	(Vm)	81.593	80.922	82.128	81.548
Meter Temperature, °F	(Tm)	91.0	96.4	94.4	93.9
Meter Temperature, °R	(Tm)	550.6	556.1	554.0	553.6
Meter Orifice Pressure, in. WC	(ΔH)	2.104	2.065	2.131	2.100
Volume H ₂ O Collected, mL	(Vlc)	23.6	24.4	26.0	24.7
Nozzle Diameter, in	(Dn)	0.262	0.262	0.262	0.262
Area of Nozzle, ft ²	(An)	0.0004	0.0004	0.0004	0.0004
FH HFPO-DA Mass, ng	M _(HFPODA)	15,100.0	77,700.0	23,700.0	38,833.3
BH HFPO-DA Mass, ng	M _(HFPODA)	4,190.0	20,400.0	4,360.0	9,650.0
Imp HFPO-DA Mass, ng	M _(HFPODA)	39.2	213.0	21.2	91.1
Breakthrough HFPO-DA Mass, ng	M _(HFPODA)	2.81	43.6	2.1	22.8
Total HFPO-DA Mass, ng	M _(HFPODA)	19,329.2	98,356.6	28,083.3	48,589.7
ISOKINETIC DATA					
Standard Meter Volume, ft ³	(Vmstd)	77.785	76.381	77.817	77.328
Standard Water Volume, ft ³	(Vwstd)	1.113	1.151	1.226	1.163
Moisture Fraction Measured	(BWSmsd)	0.014	0.015	0.016	0.015
Moisture Fraction @ Saturation	(BWSsat)	0.037	0.042	0.040	0.040
Moisture Fraction	(BWS)	0.014	0.015	0.016	0.015
Meter Pressure, in Hg	(Pm)	30.00	30.00	30.01	30.00
Volume at Nozzle, ft ³	(Vn)	81.253	80.392	81.828	81.16
Isokinetic Sampling Rate, (%)	(I)	97.8	97.6	97.8	97.7
DGM Calibration Check Value, (+/- 5%)	(Y _{qa})	-2.6	-3.0	-3.0	-2.9
EMISSION CALCULATIONS					
HFPO-DA Concentration, ng/dscm	C _(HFPODA)	8.8E+03	4.5E+04	1.3E+04	2.2E+04
HFPO-DA Emission Rate, lb/hr	ER _(HFPODA)	5.0E-04	2.5E-03	7.3E-04	1.3E-03
REDUCTION CALCULATIONS					
Inlet HFPO-DA Emission Rate, lb/hr	ER _(HFPODA)	1.1E-03	6.2E-03	1.7E-03	3.0E-03
HFPO-DA Reduction Efficiency, %	ER _(HFPODA)	55.6	58.9	57.3	57.3

Location Ramboll - Chemours Fayetteville Works Facility, NC
Source Semiworks Carbon Bed Outlet
Project No. 2021-13240
Parameter HFPO-DA

Run Number		Run 1	Run 2	Run 3	Average
Date		5/5/21	5/5/21	5/5/21	--
Start Time		11:12	14:05	16:52	--
Stop Time		1:14	16:04	18:48	--
Run Time, min		96.0	96.0	96.0	96.0
VELOCITY HEAD, in. WC					
Point 1		0.46	0.50	0.52	0.49
Point 2		0.46	0.50	0.50	0.49
Point 3		0.45	0.50	0.50	0.48
Point 4		0.47	0.48	0.49	0.48
Point 5		0.48	0.48	0.49	0.48
Point 6		0.52	0.48	0.49	0.50
Point 7		0.52	0.45	0.45	0.47
Point 8		0.51	0.44	0.45	0.47
Point 9		0.45	0.40	0.44	0.43
Point 10		0.46	0.38	0.44	0.43
Point 11		0.43	0.38	0.38	0.40
Point 12		0.43	0.38	0.38	0.40
Point 13		0.49	0.46	0.45	0.47
Point 14		0.50	0.47	0.45	0.47
Point 15		0.49	0.47	0.45	0.47
Point 16		0.49	0.47	0.45	0.47
Point 17		0.48	0.48	0.45	0.47
Point 18		0.48	0.48	0.47	0.48
Point 19		0.43	0.46	0.47	0.45
Point 20		0.43	0.46	0.47	0.45
Point 21		0.38	0.40	0.47	0.42
Point 22		0.38	0.40	0.45	0.41
Point 23		0.38	0.38	0.45	0.40
Point 24		0.38	0.38	0.45	0.40
CALCULATED DATA					
Square Root of ΔP , (in. WC) ^{1/2}	(ΔP)	0.675	0.666	0.677	0.673
Pitot Tube Coefficient	(Cp)	0.840	0.840	0.840	0.840
Barometric Pressure, in. Hg	(Pb)	29.85	29.85	29.85	29.85
Static Pressure, in. WC	(Pg)	-0.15	-0.15	-0.15	-0.15
Stack Pressure, in. Hg	(Ps)	29.84	29.84	29.84	29.84
Stack Cross-sectional Area, ft ²	(As)	6.87	6.87	6.87	6.87
Temperature, °F	(Ts)	82.3	86.0	85.1	84.5
Temperature, °R	(Ts)	542.0	545.7	544.8	544.142
Moisture Fraction Measured	(BWSmsd)	0.014	0.015	0.016	0.015
Moisture Fraction @ Saturation	(BWSsat)	0.037	0.042	0.040	0.040
Moisture Fraction	(BWS)	0.014	0.015	0.016	0.015
O ₂ Concentration, %	(O ₂)	20.9	20.9	20.9	20.9
CO ₂ Concentration, %	(CO ₂)	0.1	0.1	0.1	0.1
Molecular Weight, lb/lb-mole (dry)	(Md)	28.85	28.85	28.85	28.85
Molecular Weight, lb/lb-mole (wet)	(Ms)	28.70	28.69	28.68	28.69
Velocity, ft/sec	(Vs)	38.5	38.2	38.8	38.5
VOLUMETRIC FLOW RATE					
At Stack Conditions, acfm	(Qa)	15,896	15,754	15,994	15,881
At Standard Conditions, dscfm	(Qs)	15,217	14,967	15,209	15,131

Location **Ramboll - Chemours Fayetteville Works Facility, NC**

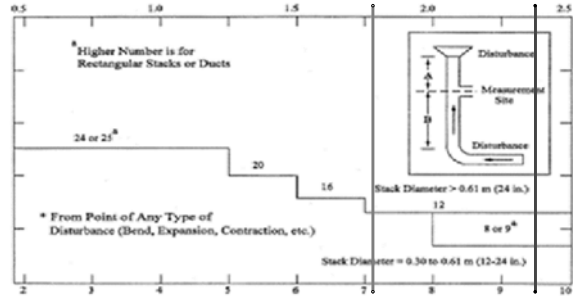
Source **Semiworks Carbon Bed Outlet**

Project No. **2021-13240**

Date: **05/05/21**

Stack Parameters

Duct Orientation:	Vertical
Duct Design:	Circular
Distance from Far Wall to Outside of Port:	52.50 in
Nipple Length:	17.00 in
Depth of Duct:	35.50 in
Cross Sectional Area of Duct:	6.87 ft ²
No. of Test Ports:	2
Distance A:	7.0 ft
Distance A Duct Diameters:	2.4 (must be > 0.5)
Distance B:	21.0 ft
Distance B Duct Diameters:	7.1 (must be > 2)
Minimum Number of Traverse Points:	12
Actual Number of Traverse Points:	12
Number of Readings per Point:	2



CIRCULAR DUCT

LOCATION OF TRAVERSE POINTS

Number of traverse points on a diameter

	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	--	25.0	--	14.6	--	10.5	--	8.2	--	6.7
3	--	--	75.0	--	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	--	25.0
6	--	--	--	--	95.6	--	80.6	--	65.8	--	35.6
7	--	--	--	--	--	--	89.5	--	77.4	--	64.4
8	--	--	--	--	--	--	96.8	--	85.4	--	75.0
9	--	--	--	--	--	--	--	--	91.8	--	82.3
10	--	--	--	--	--	--	--	--	97.4	--	88.2
11	--	--	--	--	--	--	--	--	--	--	93.3
12	--	--	--	--	--	--	--	--	--	--	97.9

Traverse Point	% of Diameter	Distance from inside wall	Distance from outside of port
1	4.4	1.56	18.56
2	14.6	5.18	22.18
3	29.6	10.51	27.51
4	70.4	24.99	41.99
5	85.4	30.32	47.32
6	95.6	33.94	50.94
7	--	--	--
8	--	--	--
9	--	--	--
10	--	--	--
11	--	--	--
12	--	--	--

*Percent of stack diameter from inside wall to traverse point.

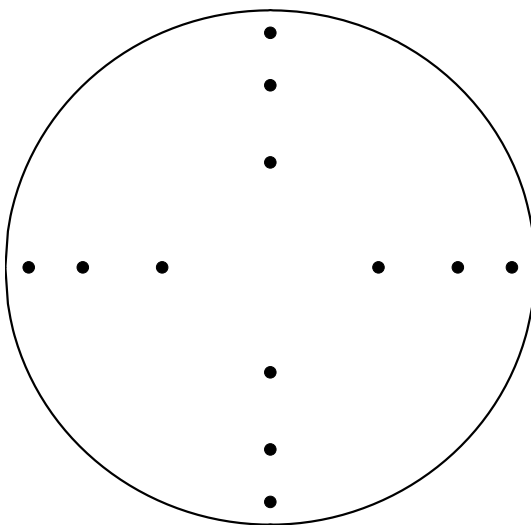
Stack Diagram

A = 7 ft.

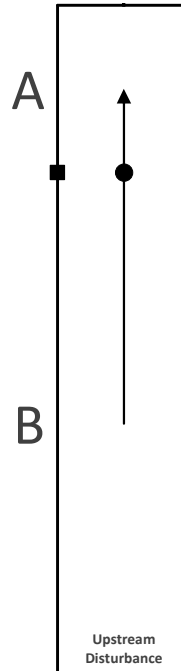
B = 21 ft.

Depth of Duct = 35.5 in.

Cross Sectional Area



Downstream Disturbance



Upstream Disturbance

Location Ramboll - Chemours Fayetteville Works Facility, NC
Source Semiworks Carbon Bed Outlet
Project No. 2021-13240
Date 05/05/21

Sample Point	Angle ($\Delta P=0$)
1	5
2	7
3	5
4	3
5	5
6	3
7	0
8	3
9	3
10	5
11	7
12	7
Average	4

Location **Ramboll - Chemours Fayetteville Works Facility, NC**
 Source **Semiworks Carbon Bed Outlet**
 Project No. **2021-13240**
 Parameter **HFPO-DA**
 Analysis **Gravimetric**

Run 1	Date: 5/5/21								
Impinger No.	1	2	3	4	5	6	7	8	Total
Contents	XAD Trap	Empty	H2O	H2O	H2O	Empty	XAD Trap	Silica	--
Initial Mass, g	0.0	0.0	100.0	100.0	100.0	0.0	0.0	855.6	1155.6
Final Mass, g	0.0	2.0	102.0	100.0	100.0	2.0	0.0	873.2	1179.2
Gain	0.0	2.0	2.0	0.0	0.0	2.0	0.0	17.6	23.6
Run 2	Date: 5/5/21								
Impinger No.	1	2	3	4	5	6	7	8	Total
Contents	XAD Trap	Empty	H2O	H2O	H2O	Empty	XAD Trap	Silica	--
Initial Mass, g	0.0	0.0	100.0	100.0	100.0	0.0	0.0	844.2	1144.2
Final Mass, g	0.0	2.0	102.0	100.0	102.0	4.0	0.0	858.6	1168.6
Gain	0.0	2.0	2.0	0.0	2.0	4.0	0.0	14.4	24.4
Run 3	Date: 5/5/21								
Impinger No.	1	2	3	4	5	6	7	8	Total
Contents	XAD Trap	Empty	H2O	H2O	H2O	Empty	XAD Trap	Silica	--
Initial Mass, g	0.0	0.0	100.0	100.0	100.0	0.0	0.0	832.6	1132.6
Final Mass, g	0.0	2.0	102.0	102.0	100.0	2.0	0.0	850.6	1158.6
Gain	0.0	2.0	2.0	2.0	0.0	2.0	0.0	18.0	26.0

Location: Ramboll - Chemours Fayetteville Works Facility, NC				Start Time: 11:12		Source: Semiworks Carbon Bed Outlet								
Date: 5/5/21		Run 1		VALID		End Time: 1:14		Project No.: 2021-13240		Parameter: HFPO-DA				
STACK DATA (EST)			EQUIPMENT		STACK DATA (EST)			FILTER NO.	STACK DATA (FINAL)			MOIST. DATA		
Moisture: 1.0 % est.			Meter Box ID: 11		Est. Tm: 88 °F			OTM-45	Pb: 29.85 in. Hg			Vlc (ml)		
Barometric: 29.86 in. Hg			Y: 0.992		Est. Ts: 82 °F				Pg: -0.15 in. WC			23.6		
Static Press: -0.18 in. WC			AH @ (in.WC): 1.650		Est. AP: 0.51 in. WC				O ₂ : 20.9 %			K-FACTOR		
Stack Press: 29.85 in. Hg			Probe ID: P4-1		Est. Dn: 0.238 in.				CO ₂ : 0.1 %			4.600		
CO ₂ : 0.0 %			Liner Material: glass		Target Rate: 0.75 scfm				Check Pt.			Initial Final Corr.		
O ₂ : 20.9 %			Pitot ID: P4-1		LEAK CHECK!			Pre	Mid 1	Mid 2	Mid 3	Post	Mid 1 (cf) --	
N ₂ /CO: 79.1 %			Pitot Cp/Type: 0.840 S-type		Leak Rate (cfm): 0.000			--	--	--	--	0.000	Mid 2 (cf) --	
Md: 28.84 lb/lb-mole			Nozzle ID: G-1 glass		Vacuum (in Hg): 8			--	--	--	12	Mid 3 (cf) --		
Ms: 28.73 lb/lb-mole			Nozzle Dn (in.): 0.262		Pitot Tube: Pass			--	--	--	Pass	Mid-Point Leak Check Vol (cf): --		

Sample Pt.	Sample Time (minutes)		Dry Gas Meter Reading (ft ³)	Pitot Tube ΔP (in WC)	Gas Temperatures (°F)		Orifice Press. ΔH (in. WC)		Pump Vac (in. Hg)	Gas Temperatures (°F)				% ISO	Vs (fps)
	Begin	End			DGM Average		Ideal	Actual		Probe	Filter	Imp Exit	Aux		
					Amb.	Stack									
1	0.00	4.00	91.904	0.46	83	81	2.10	2.10	7	82	85	67	68	98.1	38.68
1	4.00	8.00	95.300	0.46	85	80	2.11	2.10	7	82	85	65	59	94.9	38.64
2	8.00	12.00	98.600	0.45	86	80	2.07	2.10	7	82	85	67	56	98.7	38.22
2	12.00	16.00	102.000	0.47	87	81	2.16	2.15	7	82	85	62	53	96.5	39.09
3	16.00	20.00	105.400	0.48	87	81	2.20	2.20	7	82	85	60	53	98.3	39.51
3	20.00	24.00	108.900	0.52	88	80	2.40	2.40	7	82	85	60	54	91.5	41.08
4	24.00	28.00	112.300	0.52	89	80	2.40	2.40	7	82	85	60	53	94.1	41.08
4	28.00	32.00	115.800	0.51	89	81	2.35	2.35	7	82	85	60	53	100.5	40.72
5	32.00	36.00	119.500	0.45	89	81	2.08	1.75	6	82	85	61	56	95.3	38.25
5	36.00	40.00	122.800	0.46	89	82	2.12	2.10	6	82	85	61	56	94.4	38.71
6	40.00	44.00	126.100	0.43	90	82	1.98	2.00	6	82	85	61	56	97.4	37.43
6	44.00	48.00	129.400	0.43	90	82	1.98	2.00	6	82	85	62	57	98.0	37.43
1	48.00	52.00	132.719	0.49	90	83	2.25	2.25	7	82	85	67	61	93.7	39.99
1	52.00	56.00	136.100	0.50	91	83	2.30	2.30	7	82	85	59	58	98.6	40.40
2	56.00	60.00	139.700	0.49	92	84	2.26	2.30	7	82	85	58	57	96.7	40.03
2	60.00	64.00	143.200	0.49	95	84	2.27	2.30	7	82	85	58	57	98.9	40.03
3	64.00	68.00	146.800	0.48	95	84	2.22	2.25	7	82	85	57	56	99.9	39.62
3	68.00	72.00	150.400	0.48	95	83	2.23	2.25	7	82	85	58	57	99.8	39.58
4	72.00	76.00	154.000	0.43	95	83	2.00	2.00	7	84	85	58	57	101.0	37.46
4	76.00	80.00	157.450	0.43	95	83	2.00	2.00	7	83	85	58	58	98.1	37.46
5	80.00	84.00	160.800	0.38	95	83	1.77	1.80	7	83	85	59	59	99.9	35.22
5	84.00	88.00	164.010	0.38	96	84	1.77	1.80	7	85	85	60	60	99.2	35.25
6	88.00	92.00	167.200	0.38	96	85	1.76	1.80	7	86	86	60	59	96.5	35.28
6	92.00	96.00	170.300	0.38	96	85	1.76	1.80	7	86	85	62	61	99.5	35.28
Final DGM:			173.497												

RESULTS	Run Time		Vm	ΔP	Tm	Ts	Max Vac	ΔH	%ISO	BWS	Y _{qa}				
	96.0	min	81.593	ft ³	0.46	in. WC	91.0	°F	82.3	°F	7	2.104	in. WC	97.8	0.014

Location: Ramboll - Chemours Fayetteville Works Facility, NC				Start Time: 14:05		Source: Semiworks Carbon Bed Outlet			
Date: 5/5/21		Run 2		End Time: 16:04		Project No.: 2021-13240		Parameter: HFPO-DA	
STACK DATA (EST)		EQUIPMENT		STACK DATA (EST)		FILTER NO.	STACK DATA (FINAL)		MOIST. DATA
Moisture: 1.0 % est.		Meter Box ID: 11		Est. Tm: 91 °F		OTM-45	Pb: 29.85 in. Hg		Vlc (ml)
Barometric: 29.86 in. Hg		Y: 0.992		Est. Ts: 82 °F			Pg: -0.15 in. WC		24.4
Static Press: -0.18 in. WC		AH @ (in.WC): 1.650		Est. AP: 0.46 in. WC			O ₂ : 20.9 %		K-FACTOR
Stack Press: 29.85 in. Hg		Probe ID: P4-1		Est. Dn: 0.244 in.			CO ₂ : 0.1 %		4.62
CO ₂ : 0.0 %		Liner Material: glass		Target Rate: 0.75 scfm			Check Pt. Initial Final Corr.		
O ₂ : 20.9 %		Pitot ID: P4-1		LEAK CHECK! Pre Mid 1 Mid 2 Mid 3 Post			Mid 1 (cf) --		
N ₂ /CO: 79.1 %		Pitot Cp/Type: 0.840 S-type		Leak Rate (cfm): 0.000 -- -- -- 0.000			Mid 2 (cf) --		
Md: 28.84 lb/lb-mole		Nozzle ID: G-1 glass		Vacuum (in Hg): 10 -- -- -- 15			Mid 3 (cf) --		
Ms: 28.73 lb/lb-mole		Nozzle Dn (in.): 0.262		Pitot Tube: Pass -- -- Pass			Mid-Point Leak Check Vol (cf): --		

Sample Pt.	Sample Time (minutes)		Dry Gas Meter Reading (ft ³)	Pitot Tube ΔP (in WC)	Gas Temperatures (°F)		Orifice Press. ΔH (in. WC)		Pump Vac (in. Hg)	Gas Temperatures (°F)				% ISO	Vs (fps)
	Begin	End			DGM Average		Ideal	Actual		Probe	Filter	Imp Exit	Aux		
					Amb.	Stack									
1	0.00	4.00	173.769	0.50	93	86	2.30	2.30	8	87	87	67	52	91.1	40.51
1	4.00	8.00	177.100	0.50	93	86	2.30	2.30	8	87	87	61	50	98.5	40.51
2	8.00	12.00	180.700	0.50	93	86	2.30	2.30	8	87	87	58	50	93.0	40.51
2	12.00	16.00	184.100	0.48	93	86	2.21	2.25	8	85	87	56	52	92.1	39.69
3	16.00	20.00	187.400	0.48	94	86	2.21	2.25	8	86	87	54	53	105.9	39.69
3	20.00	24.00	191.200	0.48	95	86	2.22	2.25	8	86	87	54	53	91.8	39.69
4	24.00	28.00	194.500	0.45	96	86	2.08	2.10	7	86	87	54	53	94.6	38.43
4	28.00	32.00	197.800	0.44	97	86	2.04	2.05	7	87	87	54	53	104.1	38.00
5	32.00	36.00	201.400	0.40	97	86	1.86	1.85	7	87	87	54	53	103.1	36.23
5	36.00	40.00	204.800	0.38	97	86	1.76	1.75	7	86	87	57	57	99.2	35.31
6	40.00	44.00	207.990	0.38	98	86	1.77	1.75	7	86	86	57	57	96.6	35.31
6	44.00	48.00	211.100	0.38	98	86	1.77	1.75	7	87	86	58	56	96.9	35.31
1	48.00	52.00	214.220	0.46	97	86	2.13	2.15	7	87	86	66	55	98.5	38.85
1	52.00	56.00	217.700	0.47	97	86	2.18	2.20	7	87	86	63	61	98.0	39.27
2	56.00	60.00	221.200	0.47	97	86	2.18	2.20	7	87	86	63	61	92.4	39.27
2	60.00	64.00	224.500	0.47	97	86	2.18	2.20	8	87	86	67	61	98.0	39.27
3	64.00	68.00	228.000	0.48	97	86	2.22	2.20	8	87	86	67	61	91.4	39.69
3	68.00	72.00	231.300	0.48	97	86	2.22	2.20	8	87	86	63	55	97.0	39.69
4	72.00	76.00	234.800	0.46	98	86	2.14	2.15	8	87	86	59	54	96.0	38.85
4	76.00	80.00	238.200	0.46	98	86	2.14	2.15	9	87	86	59	54	96.0	38.85
5	80.00	84.00	241.600	0.40	98	86	1.86	1.85	9	87	86	59	51	106.0	36.23
5	84.00	88.00	245.100	0.40	98	86	1.86	1.85	9	87	86	59	51	96.9	36.23
6	88.00	92.00	248.300	0.38	98	86	1.77	1.75	9	87	86	59	53	102.5	35.31
6	92.00	96.00	251.600	0.38	98	86	1.77	1.75	9	87	86	59	53	96.0	35.31
Final DGM:			254.691												

RESULTS	Run Time	Vm	ΔP	58	56	Max Vac	ΔH	%ISO	BWS	Y _{qa}
	96.0 min	80.922 ft ³	0.45 in. WC	96.4 °F	86.0 °F	9	2.065 in. WC	97.6	0.015	-3.0

Location: Ramboll - Chemours Fayetteville Works Facility, NC				Start Time: 16:52		Source: Semiworks Carbon Bed Outlet			
Date: 5/5/21		Run 3		End Time: 18:48		Project No.: 2021-13240		Parameter: HFPO-DA	

STACK DATA (EST)		EQUIPMENT		STACK DATA (EST)		FILTER NO.	STACK DATA (FINAL)		MOIST. DATA	
Moisture:	1.0 % est.	Meter Box ID:	11	Est. Tm:	96 °F	OTM-45	Pb:	29.85 in. Hg	Vlc (ml)	
Barometric:	29.86 in. Hg	Y:	0.992	Est. Ts:	86 °F		Pg:	-0.15 in. WC	26.0	
Static Press:	-0.18 in. WC	AH @ (in.WC):	1.650	Est. AP:	0.45 in. WC		O ₂ :	20.9 %	K-FACTOR	
Stack Press:	29.85 in. Hg	Probe ID:	P4-1	Est. Dn:	0.245 in.		CO ₂ :	0.1 %	4.636	
CO ₂ :	0.0 %	Liner Material:	glass	Target Rate:	0.75 scfm		Check Pt. Initial Final Corr.			
O ₂ :	20.9 %	Pitot ID:	P4-1	LEAK CHECK!	Pre Mid 1 Mid 2 Mid 3 Post		Mid 1 (cf)	--		
N ₂ /CO:	79.1 %	Pitot Cp/Type:	0.840 S-type	Leak Rate (cfm):	0.000 -- -- -- 0.000		Mid 2 (cf)	--		
Md:	28.84 lb/lb-mole	Nozzle ID:	G-1 glass	Vacuum (in Hg):	10 -- -- -- 15		Mid 3 (cf)	--		
Ms:	28.73 lb/lb-mole	Nozzle Dn (in.):	0.262	Pitot Tube:	Pass -- -- -- Pass		Mid-Point Leak Check Vol (cf):	--		

Sample Pt.	Sample Time (minutes)		Dry Gas Meter Reading (ft ³)	Pitot Tube ΔP (in WC)	Gas Temperatures (°F)		Orifice Press. ΔH (in. WC)		Pump Vac (in. Hg)	Gas Temperatures (°F)				% ISO	Vs (fps)
	Begin	End			DGM Average	Stack	Ideal	Actual		Probe	Filter	Imp Exit	Aux		
					Amb.	Amb.				Amb.	Amb.	Amb.	Amb.		
1	0.00	4.00	254.969	0.52	94	87	2.39	2.40	9	87	86	66	63	100.0	41.35
1	4.00	8.00	258.700	0.50	95	87	2.30	2.30	9	87	86	66	63	92.7	40.55
2	8.00	12.00	262.100	0.50	95	87	2.30	2.30	9	87	86	66	62	100.9	40.55
2	12.00	16.00	265.800	0.49	95	87	2.26	2.25	9	87	86	62	63	96.4	40.14
3	16.00	20.00	269.300	0.49	95	86	2.26	2.25	9	87	86	60	64	101.8	40.10
3	20.00	24.00	273.000	0.49	95	86	2.26	2.25	9	84	85	59	63	99.1	40.10
4	24.00	28.00	276.600	0.45	95	85	2.08	2.10	8	84	85	60	58	100.4	38.39
4	28.00	32.00	280.100	0.45	95	85	2.08	2.10	8	84	85	60	59	100.4	38.39
5	32.00	36.00	283.600	0.44	95	85	2.04	2.05	8	84	85	60	64	95.7	37.97
5	36.00	40.00	286.900	0.44	95	85	2.04	2.05	8	84	85	58	60	98.6	37.97
6	40.00	44.00	290.300	0.38	95	85	1.76	1.75	8	85	85	58	60	98.2	35.28
6	44.00	48.00	293.450	0.38	95	85	1.76	1.75	8	85	85	58	60	100.9	35.28
1	48.00	52.00	296.684	0.45	95	85	2.08	2.10	8	87	85	68	59	95.1	38.39
1	52.00	56.00	300.000	0.45	95	85	2.08	2.10	8	87	85	65	55	100.4	38.39
2	56.00	60.00	303.500	0.45	95	85	2.08	2.10	8	85	85	60	55	91.8	38.39
2	60.00	64.00	306.700	0.45	95	85	2.08	2.10	8	85	85	60	60	100.4	38.39
3	64.00	68.00	310.200	0.45	95	85	2.08	2.10	8	85	84	60	60	91.8	38.39
3	68.00	72.00	313.400	0.47	93	84	2.17	2.20	8	83	85	62	60	101.3	39.20
4	72.00	76.00	317.000	0.47	93	84	2.17	2.20	9	83	85	62	60	98.5	39.20
4	76.00	80.00	320.500	0.47	93	84	2.17	2.20	9	83	85	62	60	92.9	39.20
5	80.00	84.00	323.800	0.47	93	84	2.17	2.20	9	83	85	62	60	92.9	39.20
5	84.00	88.00	327.100	0.45	93	84	2.08	2.10	9	83	88	61	59	93.5	38.36
6	88.00	92.00	330.350	0.45	93	84	2.08	2.10	9	85	88	61	59	99.2	38.36
6	92.00	96.00	333.800	0.45	93	84	2.08	2.10	9	85	87	61	59	94.8	38.36
Final DGM:			337.097												

RESULTS	Run Time	Vm	AP	Tm	Ts	Max Vac	ΔH	%ISO	BWS	Y _{qa}
		96.0 min	82.128 ft ³	0.46 in. WC	94.4 °F	85.1 °F	9	2.131 in. WC	97.8	0.016

Location Ramboll - Chemours Fayetteville Works Facility, NC
Source Semiworks Carbon Bed Inlet
Project No. 2021-13240
Parameter HFPO-DA

Run Number		Run 1	Run 2	Run 3	Average
Date		5/5/21	5/5/21	5/5/21	--
Start Time		11:12	14:05	16:52	--
Stop Time		13:14	16:04	18:48	--
Run Time, min	(θ)	96.0	96.0	96.0	96.0
INPUT DATA					
Barometric Pressure, in. Hg	(Pb)	29.85	29.85	29.85	29.85
Meter Correction Factor	(Y)	0.994	0.994	0.994	0.994
Orifice Calibration Value	($\Delta H @$)	1.800	1.800	1.800	1.800
Meter Volume, ft ³	(Vm)	82.436	82.124	80.779	81.780
Meter Temperature, °F	(Tm)	82.3	86.6	84.1	84.3
Meter Temperature, °R	(Tm)	541.9	546.3	543.7	544.0
Meter Orifice Pressure, in. WC	(ΔH)	2.450	2.404	2.338	2.397
Volume H ₂ O Collected, mL	(Vlc)	23.2	25.6	24.0	24.3
Nozzle Diameter, in	(Dn)	0.258	0.258	0.258	0.258
Area of Nozzle, ft ²	(An)	0.0004	0.0004	0.0004	0.0004
FH HFPO-DA Mass, ng	M _(HFPODA)	29,400.0	142,000.0	43,200.0	71,533.3
BH HFPO-DA Mass, ng	M _(HFPODA)	11,300.0	82,000.0	18,300.0	37,200.0
Imp HFPO-DA Mass, ng	M _(HFPODA)	179.0	613.0	55.3	282.4
Breakthrough HFPO-DA Mass, ng	M _(HFPODA)	4.0	33.9	2.6	13.5
Total HFPO-DA Mass, ng	M _(HFPODA)	40,883.0	224,646.9	61,557.9	109,029.2
ISOKINETIC DATA					
Standard Meter Volume, ft ³	(Vmstd)	80.077	79.132	78.188	79.132
Standard Water Volume, ft ³	(Vwstd)	1.094	1.207	1.132	1.144
Moisture Fraction Measured	(BWSmsd)	0.013	0.015	0.014	0.014
Moisture Fraction @ Saturation	(BWSsat)	0.024	0.028	0.026	0.026
Moisture Fraction	(BWS)	0.013	0.015	0.014	0.014
Meter Pressure, in Hg	(Pm)	30.03	30.03	30.02	30.03
Volume at Nozzle, ft ³	(Vn)	82.135	81.797	80.602	81.51
Isokinetic Sampling Rate, (%)	(I)	97.3	97.2	97.1	97.2
DGM Calibration Check Value, (+/- 5%)	(Y _{qa})	-3.8	-3.6	-3.6	-3.7
EMISSION CALCULATIONS					
HFPO-DA Concentration, ng/dscm	C _(HFPODA)	1.8E+04	1.0E+05	2.8E+04	4.9E+04
HFPO-DA Emission Rate, lb/hr	ER _(HFPODA)	1.1E-03	6.2E-03	1.7E-03	3.0E-03

Location Ramboll - Chemours Fayetteville Works Facility, NC
Source Semiworks Carbon Bed Inlet
Project No. 2021-13240
Parameter HFPO-DA

Run Number		Run 1	Run 2	Run 3	Average
Date		5/5/21	5/5/21	5/5/21	--
Start Time		11:12	14:05	16:52	--
Stop Time		13:14	16:04	18:48	--
Run Time, min		96.0	96.0	96.0	96.0
VELOCITY HEAD, in. WC					
Point 1		0.40	0.42	0.40	0.41
Point 2		0.42	0.43	0.40	0.42
Point 3		0.43	0.43	0.42	0.43
Point 4		0.46	0.48	0.45	0.46
Point 5		0.50	0.48	0.45	0.48
Point 6		0.52	0.50	0.50	0.51
Point 7		0.56	0.54	0.52	0.54
Point 8		0.58	0.58	0.54	0.57
Point 9		0.58	0.58	0.55	0.57
Point 10		0.58	0.58	0.55	0.57
Point 11		0.56	0.56	0.55	0.56
Point 12		0.56	0.56	0.55	0.56
Point 13		0.45	0.38	0.40	0.41
Point 14		0.45	0.43	0.41	0.43
Point 15		0.48	0.44	0.43	0.45
Point 16		0.48	0.46	0.45	0.46
Point 17		0.50	0.50	0.50	0.50
Point 18		0.50	0.53	0.52	0.52
Point 19		0.52	0.53	0.54	0.53
Point 20		0.55	0.53	0.54	0.54
Point 21		0.54	0.54	0.56	0.55
Point 22		0.54	0.54	0.52	0.53
Point 23		0.54	0.54	0.52	0.53
Point 24		0.54	0.52	0.52	0.53
CALCULATED DATA					
Square Root of ΔP , (in. WC) ^{1/2}	(ΔP)	0.713	0.708	0.700	0.707
Pitot Tube Coefficient	(Cp)	0.840	0.840	0.840	0.840
Barometric Pressure, in. Hg	(Pb)	29.85	29.85	29.85	29.85
Static Pressure, in. WC	(Pg)	-2.50	-2.30	-2.50	-2.43
Stack Pressure, in. Hg	(Ps)	29.67	29.68	29.67	29.67
Stack Cross-sectional Area, ft ²	(As)	7.07	7.07	7.07	7.07
Temperature, °F	(Ts)	69.8	73.3	72.0	71.7
Temperature, °R	(Ts)	529.4	533.0	531.7	531.351
Moisture Fraction Measured	(BWSmsd)	0.013	0.015	0.014	0.014
Moisture Fraction @ Saturation	(BWSsat)	0.024	0.028	0.026	0.026
Moisture Fraction	(BWS)	0.013	0.015	0.014	0.014
O ₂ Concentration, %	(O ₂)	20.9	20.9	20.9	20.9
CO ₂ Concentration, %	(CO ₂)	0.1	0.1	0.1	0.1
Molecular Weight, lb/lb-mole (dry)	(Md)	28.85	28.85	28.85	28.85
Molecular Weight, lb/lb-mole (wet)	(Ms)	28.71	28.69	28.70	28.70
Velocity, ft/sec	(Vs)	40.4	40.2	39.7	40.1
VOLUMETRIC FLOW RATE					
At Stack Conditions, acfm	(Qa)	17,126	17,066	16,841	17,011
At Standard Conditions, dscfm	(Qs)	16,696	16,510	16,336	16,514

Location **Ramboll - Chemours Fayetteville Works Facility, NC**

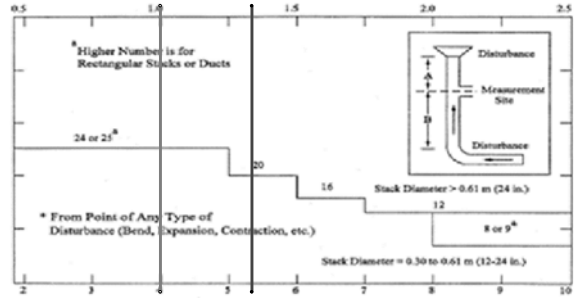
Source **Semiworks Carbon Bed Inlet**

Project No. **2021-13240**

Date: **05/05/21**

Stack Parameters

Duct Orientation:	Horizontal
Duct Design:	Circular
Distance from Far Wall to Outside of Port:	53.50 in
Nipple Length:	17.50 in
Depth of Duct:	36.00 in
Cross Sectional Area of Duct:	7.07 ft ²
No. of Test Ports:	2
Distance A:	4.0 ft
Distance A Duct Diameters:	1.3 (must be > 0.5)
Distance B:	12.0 ft
Distance B Duct Diameters:	4.0 (must be > 2)
Minimum Number of Traverse Points:	24
Actual Number of Traverse Points:	24
Number of Readings per Point:	1



CIRCULAR DUCT

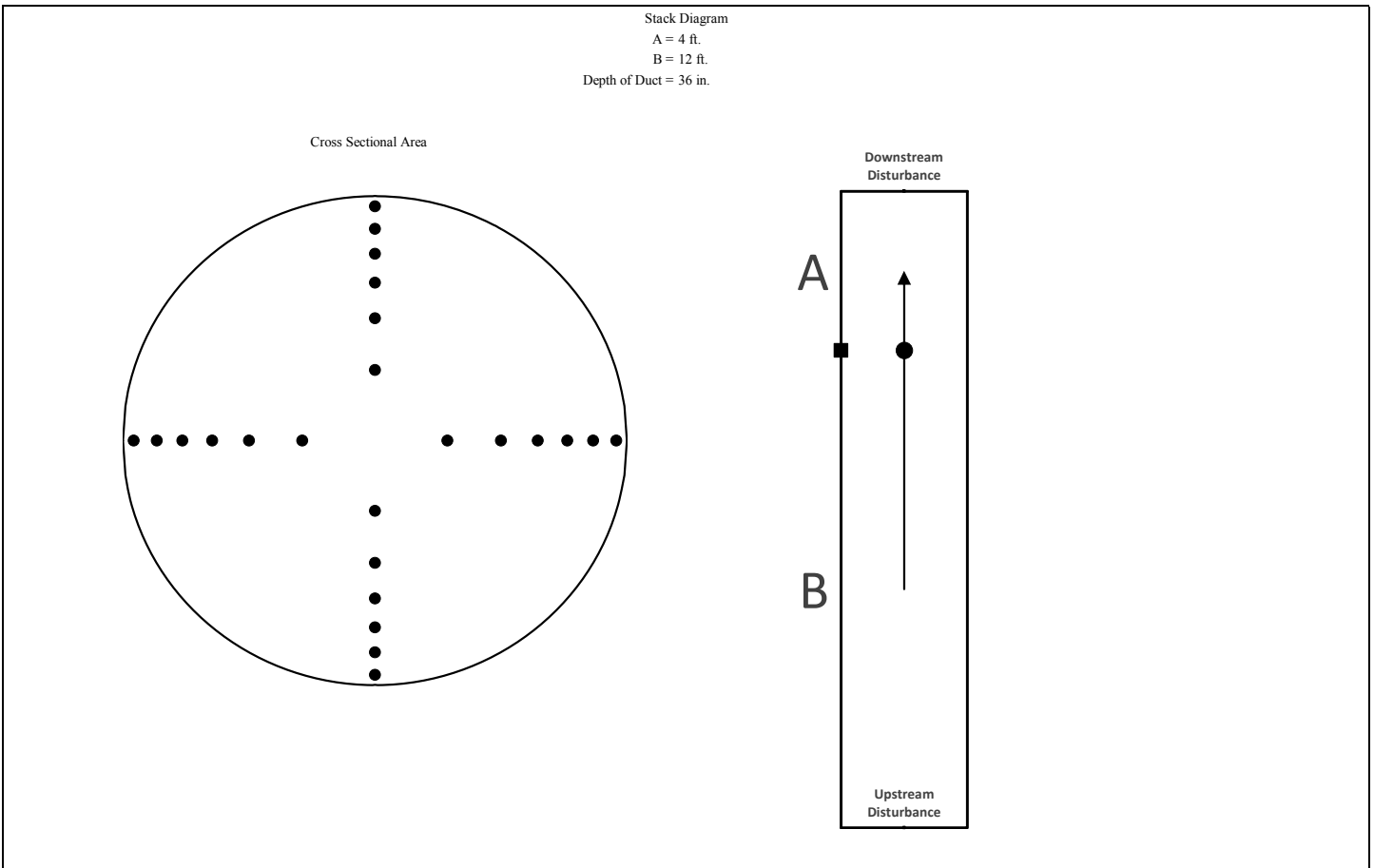
LOCATION OF TRAVERSE POINTS

Number of traverse points on a diameter

	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	--	25.0	--	14.6	--	10.5	--	8.2	--	6.7
3	--	--	75.0	--	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	--	25.0
6	--	--	--	--	95.6	--	80.6	--	65.8	--	35.6
7	--	--	--	--	--	--	89.5	--	77.4	--	64.4
8	--	--	--	--	--	--	96.8	--	85.4	--	75.0
9	--	--	--	--	--	--	--	--	91.8	--	82.3
10	--	--	--	--	--	--	--	--	97.4	--	88.2
11	--	--	--	--	--	--	--	--	--	--	93.3
12	--	--	--	--	--	--	--	--	--	--	97.9

Traverse Point	% of Diameter	Distance from inside wall	Distance from outside of port
1	2.1	1.00	18.50
2	6.7	2.41	19.91
3	11.8	4.25	21.75
4	17.7	6.37	23.87
5	25.0	9.00	26.50
6	35.6	12.82	30.32
7	64.4	23.18	40.68
8	75.0	27.00	44.50
9	82.3	29.63	47.13
10	88.2	31.75	49.25
11	93.3	33.59	51.09
12	97.9	35.00	52.50

*Percent of stack diameter from inside wall to traverse point.



Location Ramboll - Chemours Fayetteville Works Facility, NC
 Source Semiworks Carbon Bed Inlet
 Project No. 2021-13240
 Date 05/05/21

Sample Point	Angle ($\Delta P=0$)
1	2
2	5
3	10
4	9
5	3
6	5
7	8
8	9
9	10
10	3
11	2
12	2
13	5
14	7
15	7
16	6
17	8
18	5
19	5
20	10
21	8
22	12
23	12
24	10
Average	7

Location **Ramboll - Chemours Fayetteville Works Facility, NC**
 Source **Semiworks Carbon Bed Inlet**
 Project No. **2021-13240**
 Parameter **HFPO-DA**
 Analysis **Gravimetric**

Run 1	Date: 5/5/21								
Impinger No.	1	2	3	4	5	6	7	8	Total
Contents	XAD Trap	Empty	H2O	H2O	H2O	Empty	XAD Trap	Silica	--
Initial Mass, g	0.0	0.0	100.0	100.0	100.0	0.0	0.0	872.4	1172.4
Final Mass, g	0.0	2.0	102.0	100.0	100.0	2.0	0.0	889.6	1195.6
Gain	0.0	2.0	2.0	0.0	0.0	2.0	0.0	17.2	23.2
Run 2	Date: 5/5/21								
Impinger No.	1	2	3	4	5	6	7	8	Total
Contents	XAD Trap	Empty	H2O	H2O	H2O	Empty	XAD Trap	Silica	--
Initial Mass, g	0.0	0.0	100.0	100.0	100.0	0.0	0.0	865.6	1165.6
Final Mass, g	0.0	4.0	100.0	102.0	100.0	2.0	0.0	883.2	1191.2
Gain	0.0	4.0	0.0	2.0	0.0	2.0	0.0	17.6	25.6
Run 3	Date: 5/5/21								
Impinger No.	1	2	3	4	5	6	7	8	Total
Contents	XAD Trap	Empty	H2O	H2O	H2O	Empty	XAD Trap	Silica	--
Initial Mass, g	0.0	0.0	100.0	100.0	100.0	0.0	0.0	864.6	1164.6
Final Mass, g	0.0	2.0	102.0	102.0	100.0	2.0	0.0	880.6	1188.6
Gain	0.0	2.0	2.0	2.0	0.0	2.0	0.0	16.0	24.0

Location: Ramboll - Chemours Fayetteville Works Facility, NC			Start Time: 11:12		Source: Semiworks Carbon Bed Inlet					
Date: 5/5/21		Run 1	VALID	End Time: 13:14		Project No.: 2021-13240	Parameter: HFPO-DA			
STACK DATA (EST)		EQUIPMENT		STACK DATA (EST)		FILTER NO.	STACK DATA (FINAL)		MOIST. DATA	
Moisture: 1.0 % est.		Meter Box ID: 7		Est. Tm: 88 °F		OTM-45	Pb: 29.85 in. Hg		Vlc (ml)	
Barometric: 29.86 in. Hg		Y: 0.994		Est. Ts: 78 °F			Pg: -2.50 in. WC		23.2	
Static Press: -2.50 in. WC		ΔH @ (in.WC): 1.800		Est. ΔP: 0.50 in. WC			O ₂ : 20.9 %		K-FACTOR	
Stack Press: 29.68 in. Hg		Probe ID: P4-3		Est. Dn: 0.239 in.			CO ₂ : 0.1 %		4.724	
CO ₂ : 0.0 %		Liner Material: glass		Target Rate: 0.75 scfm			Check Pt. Initial Final Corr.			
O ₂ : 20.9 %		Pitot ID: P4-3		LEAK CHECK: Pre Mid 1 Mid 2 Mid 3 Post			Mid 1 (cf) 5.778 5.875 0.097			
N ₂ /CO: 79.1 %		Pitot Cp/Type: 0.840 S-type		Leak Rate (cfm): 0.005 0.005 0.005 0.007			Mid 2 (cf) --			
Md: 28.84 lb/lb-mole		Nozzle ID: G-2 glass		Vacuum (in Hg): 10 12 14 16			Mid 3 (cf) --			
Ms: 28.73 lb/lb-mole		Nozzle Dn (in.): 0.258		Pitot Tube: Pass -- -- Pass			Mid-Point Leak Check Vol (cf): 0.097			

Sample Pt.	Sample Time (minutes)		Dry Gas Meter Reading (ft ³)	Pitot Tube ΔP (in WC)	Gas Temperatures (°F)		Orifice Press. ΔH (in. WC)		Pump Vac (in. Hg)	Gas Temperatures (°F)				% ISO	Vs (fps)
	Begin	End			DGM Average	Stack	Ideal	Actual		Probe	Filter	Imp Exit	Aux		
					Amb.	Amb.				Amb.	Amb.	Amb.	Amb.		
1	0.00	4.00	184.758	0.40	77	68	1.89	1.90	4	75	75	58	50	100.4	35.73
2	4.00	8.00	187.891	0.42	78	68	1.98	2.00	5	75	74	50	50	94.7	36.61
3	8.00	12.00	190.923	0.43	79	68	2.04	2.00	5	74	74	49	49	90.6	37.05
4	12.00	16.00	193.864	0.46	80	68	2.18	2.20	5	75	75	50	49	94.5	38.32
5	16.00	20.00	197.040	0.50	81	68	2.37	2.40	6	72	76	51	52	92.7	39.95
6	20.00	24.00	200.291	0.52	81	69	2.46	2.50	6	74	75	51	51	98.2	40.78
7	24.00	28.00	203.801	0.56	81	69	2.65	2.70	6	72	75	50	49	97.1	42.32
8	28.00	32.00	207.399	0.58	82	69	2.75	2.80	7	73	74	51	51	99.7	43.07
9	32.00	36.00	211.167	0.58	82	70	2.74	2.80	7	73	75	51	51	98.1	43.11
10	36.00	40.00	214.870	0.58	83	70	2.75	2.80	7	73	74	51	51	102.2	43.11
11	40.00	44.00	218.732	0.56	83	69	2.66	2.70	7	72	76	53	50	98.0	42.32
12	44.00	48.00	222.375	0.56	83	69	2.66	2.70	7	74	77	53	51	91.5	42.32
1	48.00	52.00	225.778	0.45	82	69	2.13	2.20	6	78	76	60	53	96.7	37.93
2	52.00	56.00	229.000	0.45	82	71	2.13	2.20	6	78	77	49	49	96.0	38.01
3	56.00	60.00	232.191	0.48	83	70	2.28	2.30	6	78	78	48	50	102.0	39.22
4	60.00	64.00	235.701	0.48	84	70	2.28	2.30	7	79	78	48	49	96.9	39.22
5	64.00	68.00	239.041	0.50	84	70	2.37	2.40	7	78	78	48	49	96.3	40.02
6	68.00	72.00	242.428	0.50	84	70	2.37	2.40	7	77	76	48	51	98.6	40.02
7	72.00	76.00	245.899	0.52	85	71	2.47	2.50	7	77	75	48	50	100.6	40.86
8	76.00	80.00	249.511	0.55	85	71	2.61	2.60	8	77	76	48	50	95.5	42.02
9	80.00	84.00	253.038	0.54	85	71	2.56	2.60	8	76	78	48	50	94.6	41.63
10	84.00	88.00	256.500	0.54	85	72	2.56	2.60	8	77	78	49	51	95.7	41.67
11	88.00	92.00	260.000	0.54	86	72	2.57	2.60	8	78	79	49	52	98.5	41.67
12	92.00	96.00	263.609	0.54	86	72	2.57	2.60	8	79	80	49	48	100.5	41.67
Final DGM:			267.291												

RESULTS	Run Time	Vm	ΔP	Tm	Ts	Max Vac	ΔH	%ISO	BWS	Y _{qa}
	96.0 min	82.436 ft ³	0.51 in. WC	82.3 °F	69.8 °F	8	2.450 in. WC	97.3	0.013	-3.8

Location: Ramboll - Chemours Fayetteville Works Facility, NC				Start Time: 14:05				Source: Semiworks Carbon Bed Inlet								
Date: 5/5/21		Run 2		VALID		End Time: 16:04		Project No.: 2021-13240		Parameter: HFPO-DA						
STACK DATA (EST)			EQUIPMENT		STACK DATA (EST)			FILTER NO.	STACK DATA (FINAL)			MOIST. DATA				
Moisture: 1.0 % est.			Meter Box ID: 7		Est. Tm: 82 °F			OTM-45	Pb: 29.85 in. Hg			Vlc (ml)				
Barometric: 29.86 in. Hg			Y: 0.994		Est. Ts: 70 °F				Pg: -2.30 in. WC			25.6				
Static Press: -2.50 in. WC			AH @ (in.WC): 1.800		Est. AP: 0.51 in. WC				O ₂ : 20.9 %			K-FACTOR				
Stack Press: 29.68 in. Hg			Probe ID: P4-3		Est. Dn: 0.238 in.				CO ₂ : 0.1 %			4.75				
CO ₂ : 0.0 %			Liner Material: glass		Target Rate: 0.75 scfm				Check Pt.	Initial	Final	Corr.				
O ₂ : 20.9 %			Pitot ID: P4-3		LEAK CHECK!			Pre	Mid 1	Mid 2	Mid 3	Post	Mid 1 (cf)	9.424	10.002	0.578
N ₂ /CO: 79.1 %			Pitot Cp/Type: 0.840 S-type		Leak Rate (cfm):			0.009	0.012	0.009	--	0.007	Mid 2 (cf)			
Md: 28.84 lb/lb-mole			Nozzle ID: G-2 glass		Vacuum (in Hg):			12	14	15	--	15	Mid 3 (cf)			
Ms: 28.73 lb/lb-mole			Nozzle Dn (in.): 0.258		Pitot Tube: Pass			--	--	--	--	Pass	Mid-Point Leak Check Vol (cf): 0.578			

Sample Pt.	Sample Time (minutes)		Dry Gas Meter Reading (ft ³)	Pitot Tube AP (in WC)	Gas Temperatures (°F)		Orifice Press. ΔH (in. WC)		Pump Vac (in. Hg)	Gas Temperatures (°F)				% ISO	Vs (fps)
	Begin	End			DGM Average	Stack	Ideal	Actual		Probe	Filter	Imp Exit	Aux		
					Amb.	Amb.				Amb.	Amb.				
1	0.00	4.00	267.962	0.42	84	73	1.99	2.00	6	80	81	63	41	98.7	36.79
2	4.00	8.00	271.139	0.43	85	73	2.04	2.00	6	80	79	51	43	93.6	37.22
3	8.00	12.00	274.195	0.43	86	73	2.04	2.00	6	79	81	50	43	95.2	37.22
4	12.00	16.00	277.310	0.48	87	73	2.28	2.30	7	79	81	51	43	97.9	39.33
5	16.00	20.00	280.699	0.48	88	73	2.28	2.30	7	78	82	52	43	106.6	39.33
6	20.00	24.00	284.391	0.50	88	73	2.38	2.40	7	78	81	52	43	102.1	40.14
7	24.00	28.00	287.999	0.54	89	73	2.57	2.60	8	79	81	54	44	93.0	41.71
8	28.00	32.00	291.421	0.58	89	73	2.76	2.80	8	78	81	54	46	92.4	43.23
9	32.00	36.00	294.943	0.58	89	73	2.76	2.80	9	78	81	55	48	91.0	43.23
10	36.00	40.00	298.410	0.58	89	73	2.76	2.80	9	78	81	55	48	96.9	43.23
11	40.00	44.00	302.100	0.56	89	73	2.67	2.70	9	78	81	54	46	99.9	42.48
12	44.00	48.00	305.841	0.56	89	73	2.67	2.70	9	78	82	56	51	95.6	42.48
1	48.00	52.00	309.424	0.38	85	74	1.80	1.80	6	82	82	55	35	106.7	35.02
2	52.00	56.00	312.695	0.43	85	73	2.04	2.00	6	82	81	45	35	107.3	37.22
3	56.00	60.00	316.200	0.44	86	73	2.09	2.10	6	81	81	45	36	96.7	37.65
4	60.00	64.00	319.398	0.46	86	73	2.18	2.20	6	82	81	45	37	93.2	38.50
5	64.00	68.00	322.550	0.50	86	73	2.37	2.40	7	82	81	45	37	97.3	40.14
6	68.00	72.00	325.980	0.53	86	74	2.51	2.50	7	81	82	45	38	95.6	41.36
7	72.00	76.00	329.445	0.53	86	74	2.51	2.50	7	81	81	45	39	96.2	41.36
8	76.00	80.00	332.931	0.53	86	74	2.51	2.50	7	79	80	45	37	98.8	41.36
9	80.00	84.00	336.511	0.54	87	74	2.56	2.60	8	78	79	45	37	95.1	41.75
10	84.00	88.00	339.992	0.54	87	74	2.56	2.60	8	79	80	46	38	93.2	41.75
11	88.00	92.00	343.406	0.54	87	74	2.56	2.60	9	78	79	46	38	101.2	41.75
12	92.00	96.00	347.111	0.52	86	73	2.47	2.50	9	77	78	46	38	98.9	40.93
Final DGM:			350.664												

RESULTS	Run Time	Vm	AP	Tm	Ts	Max Vac	ΔH	%ISO	BWS	Y _{qa}
	96.0 min	82.124 ft ³	0.50 in. WC	86.6 °F	73.3 °F	9	2.404 in. WC	97.2	0.015	-3.6

Location: Ramboll - Chemours Fayetteville Works Facility, NC			Start Time: 16:52		Source: Semiworks Carbon Bed Inlet					
Date: 5/5/21		Run 3	VALID	End Time: 18:48		Project No.: 2021-13240	Parameter: HFPO-DA			
STACK DATA (EST)		EQUIPMENT		STACK DATA (EST)		FILTER NO.	STACK DATA (FINAL)		MOIST. DATA	
Moisture: 1.0 % est.		Meter Box ID: 7		Est. Tm: 87 °F		OTM-45	Pb: 29.85 in. Hg		Vlc (ml)	
Barometric: 29.86 in. Hg		Y: 0.994		Est. Ts: 73 °F			Pg: -2.50 in. WC		24.0	
Static Press: -2.50 in. WC		AH @ (in.WC): 1.800		Est. AP: 0.50 in. WC			O ₂ : 20.9 %		K-FACTOR	
Stack Press: 29.68 in. Hg		Probe ID: P4-3		Est. Dn: 0.238 in.			CO ₂ : 0.1 %		4.754	
CO ₂ : 0.0 %		Liner Material: glass		Target Rate: 0.75 scfm			Check Pt. Initial Final Corr.			
O ₂ : 20.9 %		Pitot ID: P4-3		LEAK CHECK! Pre Mid 1 Mid 2 Mid 3 Post			Mid 1 (cf) 1.939 2.184 0.245			
N ₂ /CO: 79.1 %		Pitot Cp/Type: 0.840 S-type		Leak Rate (cfm): 0.007 0.008 0.005 -- 0.006			Mid 2 (cf) --			
Md: 28.84 lb/lb-mole		Nozzle ID: G-2 glass		Vacuum (in Hg): 12 14 16 -- 12			Mid 3 (cf) --			
Ms: 28.73 lb/lb-mole		Nozzle Dn (in.): 0.258		Pitot Tube: Pass -- -- -- Pass			Mid-Point Leak Check Vol (cf): 0.245			

Sample Pt.	Sample Time (minutes)		Dry Gas Meter Reading (ft ³)	Pitot Tube AP (in WC)	Gas Temperatures (°F)				Orifice Press. ΔH (in. WC)	Pump Vac (in. Hg)	Gas Temperatures (°F)				% ISO	Vs (fps)
	Begin	End			DGM Average		Ideal	Actual			Probe	Filter	Imp Exit	Aux		
					Amb.	Stack										
1	0.00	4.00	351.654	0.40	83	74	1.88	1.90	6	81	83	64	47	100.1	35.93	
2	4.00	8.00	354.789	0.40	83	74	1.89	1.90	6	82	83	54	46	93.1	35.93	
3	8.00	12.00	357.710	0.42	84	73	1.99	2.00	6	81	82	52	47	101.8	36.79	
4	12.00	16.00	360.991	0.45	84	73	2.13	2.10	6	81	82	51	47	96.9	38.08	
5	16.00	20.00	364.221	0.45	84	72	2.13	2.10	6	82	82	50	46	99.5	38.04	
6	20.00	24.00	367.541	0.50	85	72	2.37	2.40	7	81	80	49	45	92.4	40.10	
7	24.00	28.00	370.791	0.52	86	72	2.47	2.50	8	80	79	49	45	99.0	40.89	
8	28.00	32.00	374.348	0.54	86	72	2.56	2.60	8	79	79	49	43	90.2	41.67	
9	32.00	36.00	377.650	0.55	86	73	2.61	2.60	8	81	81	50	46	95.0	42.10	
10	36.00	40.00	381.162	0.55	86	72	2.61	2.60	8	81	82	50	44	96.9	42.06	
11	40.00	44.00	384.745	0.55	86	73	2.61	2.60	8	82	82	51	44	98.4	42.10	
12	44.00	48.00	388.380	0.55	86	73	2.61	2.60	8	81	80	51	44	96.3	42.10	
1	48.00	52.00	391.939	0.40	84	73	1.89	1.90	6	77	80	57	50	101.0	35.90	
2	52.00	56.00	395.111	0.41	83	73	1.94	1.90	6	76	79	51	50	99.1	36.35	
3	56.00	60.00	398.259	0.43	83	72	2.03	2.00	6	76	78	52	51	94.0	37.19	
4	60.00	64.00	401.321	0.45	83	71	2.13	2.10	6	76	77	54	51	95.3	38.01	
5	64.00	68.00	404.500	0.50	84	70	2.37	2.40	7	75	76	54	51	96.6	40.02	
6	68.00	72.00	407.899	0.52	84	70	2.47	2.50	8	75	75	51	48	99.7	40.82	
7	72.00	76.00	411.476	0.54	84	71	2.56	2.60	8	74	75	48	46	96.3	41.63	
8	76.00	80.00	414.993	0.54	84	71	2.56	2.60	8	74	75	48	46	95.4	41.63	
9	80.00	84.00	418.478	0.56	84	71	2.65	2.70	9	74	75	46	46	100.5	42.40	
10	84.00	88.00	422.215	0.52	84	71	2.46	2.50	8	75	76	45	46	96.6	40.86	
11	88.00	92.00	425.678	0.52	84	71	2.46	2.50	8	74	75	45	47	94.5	40.86	
12	92.00	96.00	429.065	0.52	84	71	2.46	2.50	8	73	74	45	47	100.8	40.86	
Final DGM:			432.678													

RESULTS	Run Time		Vm		AP		Tm		Ts		Max Vac		ΔH		%ISO		BWS		Y _{qa}	
	96.0	min	80.779	ft ³	0.49	in. WC	84.1	°F	72.0	°F	9	2.338	in. WC	97.1	0.014			-3.6		

Appendix C

ANALYTICAL REPORT

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

Laboratory Job ID: 140-23010-1
Client Project/Site: SemiWorks CB Outlet - OTM-45

For:

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

Attn: Michael Aucoin



Authorized for release by:
5/19/2021 3:53:38 PM

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

LINKS

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www.eurofinsus.com/Env

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

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

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



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Definitions/Glossary

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

Qualifiers

LCMS

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Case Narrative

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

Job ID: 140-23010-1

Laboratory: Eurofins TestAmerica, Knoxville

Narrative

Job Narrative 140-23010-1

Sample Receipt

The samples were received on 5/8/2021 11:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.5° C.

LCMS

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

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

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

Sample results were calculated using the following equation:

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

Where:

DF = Instrument dilution factor

SF = Extraction Split Factor = (final volume of extract in the initial extraction batch / initial volume of extract in the "Split" batch)

For condensate, if less than the entire sample is extracted, the fraction of sample used replaces "1 sample"

Method 537 (modified): The required dilution factor for the following samples were higher than could be achieved by "in vial" dilution, as it would dilute out the Isotope Dilution Analytes (IDA): C-2164,2165 SEMIWORKS CB OUTLET R1 OTM-45 FH (140-23010-1), C-2171,2172 SEMIWORKS CB OUTLET R2 OTM-45 FH (140-23010-5) and C-2178,2179 SEMIWORKS CB OUTLET R3 OTM-45 FH (140-23010-9). As such, the dilution was achieved by taking a subsample of the undiluted extract, adding sufficient solvent, and re-spiking the extract with IDA.

Method 537 (modified): The following samples were reported with elevated reporting limits for all analytes: C-2164,2165 SEMIWORKS CB OUTLET R1 OTM-45 FH (140-23010-1), C-2171,2172 SEMIWORKS CB OUTLET R2 OTM-45 FH (140-23010-5) and C-2178,2179 SEMIWORKS CB OUTLET R3 OTM-45 FH (140-23010-9). The sample was analyzed at a dilution based on screening results.

Method 537 (modified): The following samples were reported with elevated reporting limits for all analytes: C-2166,2167,2169 SEMIWORKS CB OUTLET R1 OTM-45 BH (140-23010-2), C-2173,2174,2176 SEMIWORKS CB OUTLET R2 OTM-45 BH (140-23010-6) and C-2180,2181,2183 SEMIWORKS CB OUTLET R3 OTM-45 BH (140-23010-10). The sample was analyzed at a dilution based on screening results.

Method 537 (modified): The required dilution factor for the following samples were higher than could be achieved by "in vial" dilution, as it would dilute out the Isotope Dilution Analytes (IDA): C-2166,2167,2169 SEMIWORKS CB OUTLET R1 OTM-45 BH (140-23010-2), C-2173,2174,2176 SEMIWORKS CB OUTLET R2 OTM-45 BH (140-23010-6) and C-2180,2181,2183 SEMIWORKS CB OUTLET R3 OTM-45 BH (140-23010-10). As such, the dilution was achieved by taking a subsample of the undiluted extract, adding sufficient solvent, and re-spiking the extract with IDA.

Case Narrative

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

Job ID: 140-23010-1 (Continued)

Laboratory: Eurofins TestAmerica, Knoxville (Continued)

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

Organic Prep

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

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Detection Summary

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

**Client Sample ID: C-2164,2165 SEMIWORKS CB OUTLET R1
OTM-45 FH**

Lab Sample ID: 140-23010-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	15.1		0.250	0.145	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: C-2166,2167,2169 SEMIWORKS CB OUTLET
R1 OTM-45 BH**

Lab Sample ID: 140-23010-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	4.19		0.0800	0.0700	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: C-2168 SEMIWORKS CB OUTLET R1
OTM-45 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-23010-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.0392	J	0.0750	0.0124	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: C-2170 SEMIWORKS CB OUTLET R1
OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-23010-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.00281		0.00160	0.00140	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: C-2171,2172 SEMIWORKS CB OUTLET R2
OTM-45 FH**

Lab Sample ID: 140-23010-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	77.7		0.495	0.287	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: C-2173,2174,2176 SEMIWORKS CB OUTLET
R2 OTM-45 BH**

Lab Sample ID: 140-23010-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	20.4		0.200	0.175	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: C-2175 SEMIWORKS CB OUTLET R2
OTM-45 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-23010-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.213		0.0725	0.0120	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: C-2177 SEMIWORKS CB OUTLET R2
OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-23010-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.0436		0.00160	0.00140	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: C-2178,2179 SEMIWORKS CB OUTLET R3
OTM-45 FH**

Lab Sample ID: 140-23010-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	23.7		0.248	0.144	ug/Sample	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Knoxville

Detection Summary

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

Client Sample ID: C-2180,2181,2183 SEMIWORKS CB OUTLET R3 OTM-45 BH

Lab Sample ID: 140-23010-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	4.36		0.0800	0.0700	ug/Sample	1		537 (modified)	Total/NA

Client Sample ID: C-2182 SEMIWORKS CB OUTLET R3 OTM-45 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-23010-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.0212	J	0.0750	0.0124	ug/Sample	1		537 (modified)	Total/NA

Client Sample ID: C-2184 SEMIWORKS CB OUTLET R3 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-23010-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.00205		0.00160	0.00140	ug/Sample	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Knoxville

Client Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

**Client Sample ID: C-2164,2165 SEMIWORKS CB OUTLET R1
 OTM-45 FH**

Lab Sample ID: 140-23010-1

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	15.1		0.250	0.145	ug/Sample		05/10/21 13:24	05/15/21 21:02	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	93		25 - 150				05/10/21 13:24	05/15/21 21:02	1

**Client Sample ID: C-2166,2167,2169 SEMIWORKS CB OUTLET
 R1 OTM-45 BH**

Lab Sample ID: 140-23010-2

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	4.19		0.0800	0.0700	ug/Sample		05/10/21 09:44	05/17/21 12:36	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	97		25 - 150				05/10/21 09:44	05/17/21 12:36	1

**Client Sample ID: C-2168 SEMIWORKS CB OUTLET R1
 OTM-45 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-23010-3

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0392	J	0.0750	0.0124	ug/Sample		05/10/21 14:43	05/13/21 13:49	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	107		25 - 150				05/10/21 14:43	05/13/21 13:49	1

**Client Sample ID: C-2170 SEMIWORKS CB OUTLET R1
 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-23010-4

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.00281		0.00160	0.00140	ug/Sample		05/10/21 09:44	05/17/21 12:45	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	86		25 - 150				05/10/21 09:44	05/17/21 12:45	1

Client Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

**Client Sample ID: C-2171,2172 SEMIWORKS CB OUTLET R2
 OTM-45 FH**

Lab Sample ID: 140-23010-5

Date Collected: 05/05/21 00:00
 Date Received: 05/08/21 11:30
 Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	77.7		0.495	0.287	ug/Sample		05/10/21 13:24	05/15/21 21:11	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	95		25 - 150				05/10/21 13:24	05/15/21 21:11	1

**Client Sample ID: C-2173,2174,2176 SEMIWORKS CB OUTLET
 R2 OTM-45 BH**

Lab Sample ID: 140-23010-6

Date Collected: 05/05/21 00:00
 Date Received: 05/08/21 11:30
 Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	20.4		0.200	0.175	ug/Sample		05/10/21 09:44	05/17/21 18:38	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	99		25 - 150				05/10/21 09:44	05/17/21 18:38	1

**Client Sample ID: C-2175 SEMIWORKS CB OUTLET R2
 OTM-45 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-23010-7

Date Collected: 05/05/21 00:00
 Date Received: 05/08/21 11:30
 Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.213		0.0725	0.0120	ug/Sample		05/10/21 14:43	05/13/21 13:58	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	114		25 - 150				05/10/21 14:43	05/13/21 13:58	1

**Client Sample ID: C-2177 SEMIWORKS CB OUTLET R2
 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-23010-8

Date Collected: 05/05/21 00:00
 Date Received: 05/08/21 11:30
 Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0436		0.00160	0.00140	ug/Sample		05/10/21 09:44	05/17/21 13:03	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	81		25 - 150				05/10/21 09:44	05/17/21 13:03	1

Client Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

**Client Sample ID: C-2178,2179 SEMIWORKS CB OUTLET R3
 OTM-45 FH**

Lab Sample ID: 140-23010-9

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	23.7		0.248	0.144	ug/Sample		05/10/21 13:24	05/15/21 21:20	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	95		25 - 150				05/10/21 13:24	05/15/21 21:20	1

**Client Sample ID: C-2180,2181,2183 SEMIWORKS CB OUTLET
 R3 OTM-45 BH**

Lab Sample ID: 140-23010-10

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	4.36		0.0800	0.0700	ug/Sample		05/10/21 09:44	05/17/21 13:11	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	96		25 - 150				05/10/21 09:44	05/17/21 13:11	1

**Client Sample ID: C-2182 SEMIWORKS CB OUTLET R3
 OTM-45 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-23010-11

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0212	J	0.0750	0.0124	ug/Sample		05/10/21 14:43	05/13/21 14:06	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	107		25 - 150				05/10/21 14:43	05/13/21 14:06	1

**Client Sample ID: C-2184 SEMIWORKS CB OUTLET R3
 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-23010-12

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.00205		0.00160	0.00140	ug/Sample		05/10/21 09:44	05/17/21 13:20	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	78		25 - 150				05/10/21 09:44	05/17/21 13:20	1

Default Detection Limits

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Prep: None

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

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

Isotope Dilution Summary

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Air

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	HFPODA (25-150)			
140-23010-1	C-2164,2165 SEMIWORKS CB	93			
140-23010-2	C-2166,2167,2169 SEMIWORKS CB OUTLET R1 OTM-45 BH	97			
140-23010-3	C-2168 SEMIWORKS CB OUTLET R1 OTM-45 IMPINGEF 1,2&3 COND	107			
140-23010-4	C-2170 SEMIWORKS CB OUTLET R1 OTM-45 BREAKTHROUGH XAD-2 RESI TUBE	86			
140-23010-5	C-2171,2172 SEMIWORKS CB OUTLET R2 OTM-45 FH	95			
140-23010-6	C-2173,2174,2176 SEMIWORKS CB OUTLET R2 OTM-45 BH	99			
140-23010-7	C-2175 SEMIWORKS CB OUTLET R2 OTM-45 IMPINGEF 1,2&3 COND	114			
140-23010-8	C-2177 SEMIWORKS CB OUTLET R2 OTM-45 BREAKTHROUGH XAD-2 RESI TUBE	81			
140-23010-9	C-2178,2179 SEMIWORKS CB OUTLET R3 OTM-45 FH	95			
140-23010-10	C-2180,2181,2183 SEMIWORKS CB OUTLET R3 OTM-45 BH	96			
140-23010-11	C-2182 SEMIWORKS CB OUTLET R3 OTM-45 IMPINGEF 1,2&3 COND	107			
140-23010-12	C-2184 SEMIWORKS CB OUTLET R3 OTM-45 BREAKTHROUGH XAD-2 RESI TUBE	78			
LCS 140-49635/2-B	Lab Control Sample	90			
LCS 140-49653/2-B	Lab Control Sample	91			
LCS 140-49661/2-B	Lab Control Sample	102			
LCSD 140-49635/3-B	Lab Control Sample Dup	96			
LCSD 140-49653/3-B	Lab Control Sample Dup	95			
LCSD 140-49661/3-B	Lab Control Sample Dup	105			
MB 140-49635/1-B	Method Blank	85			
MB 140-49653/1-B	Method Blank	92			
MB 140-49661/1-B	Method Blank	109			

Surrogate Legend

HFPODA = ¹³C3 HFPO-DA

QC Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 140-49635/1-B
Matrix: Air
Analysis Batch: 49885

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 49635

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00160	0.00140	ug/Sample		05/10/21 09:44	05/17/21 12:10	1
Isotope Dilution	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
¹³ C3 HFPO-DA	85		25 - 150				05/10/21 09:44	05/17/21 12:10	1

Lab Sample ID: LCS 140-49635/2-B
Matrix: Air
Analysis Batch: 49885

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 49635

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HFPO-DA	0.0200	0.02302		ug/Sample		115	60 - 140
Isotope Dilution	%Recovery	LCS Qualifier	Limits				
¹³ C3 HFPO-DA	90		25 - 150				

Lab Sample ID: LCSD 140-49635/3-B
Matrix: Air
Analysis Batch: 49885

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 49635

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA	0.0200	0.02216		ug/Sample		111	60 - 140	4	30
Isotope Dilution	%Recovery	LCSD Qualifier	Limits						
¹³ C3 HFPO-DA	96		25 - 150						

Lab Sample ID: MB 140-49653/1-B
Matrix: Air
Analysis Batch: 49858

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 49653

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00100	0.000580	ug/Sample		05/10/21 13:24	05/15/21 20:36	1
Isotope Dilution	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
¹³ C3 HFPO-DA	92		25 - 150				05/10/21 13:24	05/15/21 20:36	1

Lab Sample ID: LCS 140-49653/2-B
Matrix: Air
Analysis Batch: 49858

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 49653

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HFPO-DA	0.0200	0.02153		ug/Sample		108	60 - 140
Isotope Dilution	%Recovery	LCS Qualifier	Limits				
¹³ C3 HFPO-DA	91		25 - 150				

QC Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

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

Lab Sample ID: LCSD 140-49653/3-B
Matrix: Air
Analysis Batch: 49858

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 49653

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA	0.0200	0.02108		ug/Sample		105	60 - 140	2	30
		LCSD	LCSD						
Isotope Dilution	%Recovery	Qualifier	Limits						
13C3 HFPO-DA	95		25 - 150						

Lab Sample ID: MB 140-49661/1-B
Matrix: Air
Analysis Batch: 49797

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 49661

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.000500	0.0000825	ug/Sample		05/10/21 14:43	05/13/21 13:05	1
		MB	MB						
Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac			
13C3 HFPO-DA	109		25 - 150	05/10/21 14:43	05/13/21 13:05	1			

Lab Sample ID: LCS 140-49661/2-B
Matrix: Air
Analysis Batch: 49797

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 49661

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
HFPO-DA	0.0100	0.01039		ug/Sample		104	60 - 140		
		LCS	LCS						
Isotope Dilution	%Recovery	Qualifier	Limits						
13C3 HFPO-DA	102		25 - 150						

Lab Sample ID: LCSD 140-49661/3-B
Matrix: Air
Analysis Batch: 49797

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 49661

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA	0.0100	0.01003		ug/Sample		100	60 - 140	3	30
		LCSD	LCSD						
Isotope Dilution	%Recovery	Qualifier	Limits						
13C3 HFPO-DA	105		25 - 150						

QC Association Summary

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

LCMS

Prep Batch: 49635

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23010-2	C-2166,2167,2169 SEMIWORKS CB OUTLET R	Total/NA	Air	None	
140-23010-4	C-2170 SEMIWORKS CB OUTLET R1 OTM-45 E	Total/NA	Air	None	
140-23010-6	C-2173,2174,2176 SEMIWORKS CB OUTLET R:	Total/NA	Air	None	
140-23010-8	C-2177 SEMIWORKS CB OUTLET R2 OTM-45 E	Total/NA	Air	None	
140-23010-10	C-2180,2181,2183 SEMIWORKS CB OUTLET R:	Total/NA	Air	None	
140-23010-12	C-2184 SEMIWORKS CB OUTLET R3 OTM-45 E	Total/NA	Air	None	
MB 140-49635/1-B	Method Blank	Total/NA	Air	None	
LCS 140-49635/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-49635/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Prep Batch: 49653

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23010-1	C-2164,2165 SEMIWORKS CB OUTLET R1 OTM	Total/NA	Air	None	
140-23010-5	C-2171,2172 SEMIWORKS CB OUTLET R2 OTM	Total/NA	Air	None	
140-23010-9	C-2178,2179 SEMIWORKS CB OUTLET R3 OTM	Total/NA	Air	None	
MB 140-49653/1-B	Method Blank	Total/NA	Air	None	
LCS 140-49653/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-49653/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Prep Batch: 49661

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23010-3	C-2168 SEMIWORKS CB OUTLET R1 OTM-45 I	Total/NA	Air	None	
140-23010-7	C-2175 SEMIWORKS CB OUTLET R2 OTM-45 I	Total/NA	Air	None	
140-23010-11	C-2182 SEMIWORKS CB OUTLET R3 OTM-45 I	Total/NA	Air	None	
MB 140-49661/1-B	Method Blank	Total/NA	Air	None	
LCS 140-49661/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-49661/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Cleanup Batch: 49725

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23010-3	C-2168 SEMIWORKS CB OUTLET R1 OTM-45 I	Total/NA	Air	Split	49661
140-23010-7	C-2175 SEMIWORKS CB OUTLET R2 OTM-45 I	Total/NA	Air	Split	49661
140-23010-11	C-2182 SEMIWORKS CB OUTLET R3 OTM-45 I	Total/NA	Air	Split	49661
MB 140-49661/1-B	Method Blank	Total/NA	Air	Split	49661
LCS 140-49661/2-B	Lab Control Sample	Total/NA	Air	Split	49661
LCSD 140-49661/3-B	Lab Control Sample Dup	Total/NA	Air	Split	49661

Cleanup Batch: 49746

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23010-1	C-2164,2165 SEMIWORKS CB OUTLET R1 OTM	Total/NA	Air	Split	49653
140-23010-5	C-2171,2172 SEMIWORKS CB OUTLET R2 OTM	Total/NA	Air	Split	49653
140-23010-9	C-2178,2179 SEMIWORKS CB OUTLET R3 OTM	Total/NA	Air	Split	49653
MB 140-49653/1-B	Method Blank	Total/NA	Air	Split	49653
LCS 140-49653/2-B	Lab Control Sample	Total/NA	Air	Split	49653
LCSD 140-49653/3-B	Lab Control Sample Dup	Total/NA	Air	Split	49653

Cleanup Batch: 49764

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23010-2	C-2166,2167,2169 SEMIWORKS CB OUTLET R	Total/NA	Air	Split	49635
140-23010-4	C-2170 SEMIWORKS CB OUTLET R1 OTM-45 E	Total/NA	Air	Split	49635
140-23010-6	C-2173,2174,2176 SEMIWORKS CB OUTLET R:	Total/NA	Air	Split	49635

Eurofins TestAmerica, Knoxville

QC Association Summary

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

LCMS (Continued)

Cleanup Batch: 49764 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23010-8	C-2177 SEMIWORKS CB OUTLET R2 OTM-45 E	Total/NA	Air	Split	49635
140-23010-10	C-2180,2181,2183 SEMIWORKS CB OUTLET R	Total/NA	Air	Split	49635
140-23010-12	C-2184 SEMIWORKS CB OUTLET R3 OTM-45 E	Total/NA	Air	Split	49635
MB 140-49635/1-B	Method Blank	Total/NA	Air	Split	49635
LCS 140-49635/2-B	Lab Control Sample	Total/NA	Air	Split	49635
LCSD 140-49635/3-B	Lab Control Sample Dup	Total/NA	Air	Split	49635

Analysis Batch: 49797

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23010-3	C-2168 SEMIWORKS CB OUTLET R1 OTM-45 I	Total/NA	Air	537 (modified)	49725
140-23010-7	C-2175 SEMIWORKS CB OUTLET R2 OTM-45 I	Total/NA	Air	537 (modified)	49725
140-23010-11	C-2182 SEMIWORKS CB OUTLET R3 OTM-45 I	Total/NA	Air	537 (modified)	49725
MB 140-49661/1-B	Method Blank	Total/NA	Air	537 (modified)	49725
LCS 140-49661/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	49725
LCSD 140-49661/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	49725

Analysis Batch: 49858

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23010-1	C-2164,2165 SEMIWORKS CB OUTLET R1 OTM	Total/NA	Air	537 (modified)	49859
140-23010-5	C-2171,2172 SEMIWORKS CB OUTLET R2 OTM	Total/NA	Air	537 (modified)	49859
140-23010-9	C-2178,2179 SEMIWORKS CB OUTLET R3 OTM	Total/NA	Air	537 (modified)	49859
MB 140-49653/1-B	Method Blank	Total/NA	Air	537 (modified)	49746
LCS 140-49653/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	49746
LCSD 140-49653/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	49746

Cleanup Batch: 49859

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23010-1	C-2164,2165 SEMIWORKS CB OUTLET R1 OTM	Total/NA	Air	Dilution	49746
140-23010-5	C-2171,2172 SEMIWORKS CB OUTLET R2 OTM	Total/NA	Air	Dilution	49746
140-23010-9	C-2178,2179 SEMIWORKS CB OUTLET R3 OTM	Total/NA	Air	Dilution	49746

Analysis Batch: 49885

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23010-2	C-2166,2167,2169 SEMIWORKS CB OUTLET R	Total/NA	Air	537 (modified)	49886
140-23010-4	C-2170 SEMIWORKS CB OUTLET R1 OTM-45 E	Total/NA	Air	537 (modified)	49764
140-23010-6	C-2173,2174,2176 SEMIWORKS CB OUTLET R	Total/NA	Air	537 (modified)	49886
140-23010-8	C-2177 SEMIWORKS CB OUTLET R2 OTM-45 E	Total/NA	Air	537 (modified)	49764
140-23010-10	C-2180,2181,2183 SEMIWORKS CB OUTLET R	Total/NA	Air	537 (modified)	49886
140-23010-12	C-2184 SEMIWORKS CB OUTLET R3 OTM-45 E	Total/NA	Air	537 (modified)	49764
MB 140-49635/1-B	Method Blank	Total/NA	Air	537 (modified)	49764
LCS 140-49635/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	49764
LCSD 140-49635/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	49764

Cleanup Batch: 49886

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23010-2	C-2166,2167,2169 SEMIWORKS CB OUTLET R	Total/NA	Air	Dilution	49764
140-23010-6	C-2173,2174,2176 SEMIWORKS CB OUTLET R	Total/NA	Air	Dilution	49764
140-23010-10	C-2180,2181,2183 SEMIWORKS CB OUTLET R	Total/NA	Air	Dilution	49764

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

**Client Sample ID: C-2164,2165 SEMIWORKS CB OUTLET R1
 OTM-45 FH**

Lab Sample ID: 140-23010-1

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	108 mL	49653	05/10/21 13:24	DWS	TAL KNX
Total/NA	Cleanup	Split			54 mL	10 mL	49746	05/12/21 09:53	DWS	TAL KNX
Total/NA	Cleanup	Dilution			40 uL	10000 uL	49859	05/15/21 18:33	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			49858	05/15/21 21:02	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: C-2166,2167,2169 SEMIWORKS CB OUTLET
 R1 OTM-45 BH**

Lab Sample ID: 140-23010-2

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			36 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Cleanup	Dilution			1000 uL	10000 uL	49886	05/17/21 10:49	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 12:36	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: C-2168 SEMIWORKS CB OUTLET R1
 OTM-45 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-23010-3

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.00667 Sample	10 mL	49661	05/10/21 14:43	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	49725	05/11/21 15:00	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49797	05/13/21 13:49	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: C-2170 SEMIWORKS CB OUTLET R1
 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-23010-4

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 12:45	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

**Client Sample ID: C-2171,2172 SEMIWORKS CB OUTLET R2
 OTM-45 FH**

Lab Sample ID: 140-23010-5

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	101 mL	49653	05/10/21 13:24	DWS	TAL KNX
Total/NA	Cleanup	Split			51 mL	10 mL	49746	05/12/21 09:53	DWS	TAL KNX
Total/NA	Cleanup	Dilution			20 uL	10000 uL	49859	05/15/21 18:33	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			49858	05/15/21 21:11	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: C-2173,2174,2176 SEMIWORKS CB OUTLET
 R2 OTM-45 BH**

Lab Sample ID: 140-23010-6

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			36 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Cleanup	Dilution			400 uL	10000 uL	49886	05/17/21 10:49	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 18:38	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: C-2175 SEMIWORKS CB OUTLET R2
 OTM-45 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-23010-7

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.0069 Sample	10 mL	49661	05/10/21 14:43	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	49725	05/11/21 15:00	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49797	05/13/21 13:58	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: C-2177 SEMIWORKS CB OUTLET R2
 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-23010-8

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 13:03	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

**Client Sample ID: C-2178,2179 SEMIWORKS CB OUTLET R3
 OTM-45 FH**

Lab Sample ID: 140-23010-9

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	107 mL	49653	05/10/21 13:24	DWS	TAL KNX
Total/NA	Cleanup	Split			54 mL	10 mL	49746	05/12/21 09:53	DWS	TAL KNX
Total/NA	Cleanup	Dilution			40 uL	10000 uL	49859	05/15/21 18:33	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			49858	05/15/21 21:20	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: C-2180,2181,2183 SEMIWORKS CB OUTLET
 R3 OTM-45 BH**

Lab Sample ID: 140-23010-10

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			36 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Cleanup	Dilution			1000 uL	10000 uL	49886	05/17/21 10:49	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 13:11	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: C-2182 SEMIWORKS CB OUTLET R3
 OTM-45 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-23010-11

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.00667 Sample	10 mL	49661	05/10/21 14:43	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	49725	05/11/21 15:00	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49797	05/13/21 14:06	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: C-2184 SEMIWORKS CB OUTLET R3
 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-23010-12

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 13:20	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

Client Sample ID: Method Blank

Lab Sample ID: MB 140-49635/1-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 12:10	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-49653/1-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	49653	05/10/21 13:24	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	49746	05/12/21 09:53	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49858	05/15/21 20:36	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Method Blank

Lab Sample ID: MB 140-49661/1-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	10 mL	49661	05/10/21 14:43	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	49725	05/11/21 15:00	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49797	05/13/21 13:05	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-49635/2-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 12:18	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-49653/2-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	49653	05/10/21 13:24	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	49746	05/12/21 09:53	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49858	05/15/21 20:45	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-49661/2-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	10 mL	49661	05/10/21 14:43	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	49725	05/11/21 15:00	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49797	05/13/21 13:14	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-49635/3-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 12:27	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-49653/3-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	49653	05/10/21 13:24	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	49746	05/12/21 09:53	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49858	05/15/21 20:54	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-49661/3-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	10 mL	49661	05/10/21 14:43	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	49725	05/11/21 15:00	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49797	05/13/21 13:22	JRC	TAL KNX
Instrument ID: LCA										

Laboratory References:

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

Accreditation/Certification Summary

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

Laboratory: Eurofins TestAmerica, Knoxville

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

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

Method Summary

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1

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

Protocol References:

- EPA = US Environmental Protection Agency
- None = None
- TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

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



Sample Summary

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Outlet - OTM-45

Job ID: 140-23010-1


Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-23010-1	C-2164,2165 SEMIWORKS CB OUTLET R1 OTM-45 FH	Air	05/05/21 00:00	05/08/21 11:30	
140-23010-2	C-2166,2167,2169 SEMIWORKS CB OUTLET R OTM-45 BH	Air	05/05/21 00:00	05/08/21 11:30	
140-23010-3	C-2168 SEMIWORKS CB OUTLET R1 OTM-45 IMPINGERS 1,2&3 COND	Air	05/05/21 00:00	05/08/21 11:30	
140-23010-4	C-2170 SEMIWORKS CB OUTLET R1 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE	Air	05/05/21 00:00	05/08/21 11:30	
140-23010-5	C-2171,2172 SEMIWORKS CB OUTLET R2 OTM-45 FH	Air	05/05/21 00:00	05/08/21 11:30	
140-23010-6	C-2173,2174,2176 SEMIWORKS CB OUTLET R OTM-45 BH	Air	05/05/21 00:00	05/08/21 11:30	
140-23010-7	C-2175 SEMIWORKS CB OUTLET R2 OTM-45 IMPINGERS 1,2&3 COND	Air	05/05/21 00:00	05/08/21 11:30	
140-23010-8	C-2177 SEMIWORKS CB OUTLET R2 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE	Air	05/05/21 00:00	05/08/21 11:30	
140-23010-9	C-2178,2179 SEMIWORKS CB OUTLET R3 OTM-45 FH	Air	05/05/21 00:00	05/08/21 11:30	
140-23010-10	C-2180,2181,2183 SEMIWORKS CB OUTLET R OTM-45 BH	Air	05/05/21 00:00	05/08/21 11:30	
140-23010-11	C-2182 SEMIWORKS CB OUTLET R3 OTM-45 IMPINGERS 1,2&3 COND	Air	05/05/21 00:00	05/08/21 11:30	
140-23010-12	C-2184 SEMIWORKS CB OUTLET R3 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE	Air	05/05/21 00:00	05/08/21 11:30	

Request for Analysis/Chain-of-Custody – RFA/COC #007
The Chemours Company – Fayetteville NC
SemiWorks Carbon Bed Outlet



Environment Testing
 TestAmerica

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

Laboratory Deliverable Turnaround Requirements:	
Analytical Due Date: (Review-Released Data)	21 Days from Lab Receipt
Data Package I	 140-23010 Chain of Custody

Laboratory Destination:	Eurofins TestAmerica 5815 Middlebrook Pike Knoxville, TN
Lab Phone Number:	(865) 291-3000
Courier:	Hand Deliver

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

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

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

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
C-2164 SemiWorks CB Outlet R1 OTM-45 Filter (Combine with C-2165)	1	5/5/21		125 mL HDPE Wide-Mouth Bottle	Particulate Filter (82.6 mm Whatman Glass Microfiber) OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Front-Half Probe Rinse to assist the solvent extraction of the Particulate Filter sample. Analyze for HFPO-DA using Method 8321A-HFPO.
C-2165 SemiWorks CB Outlet R1 OTM-45 FH of Filter Holder & Probe Methanol Rinse (Combine with C-2164)	1	5/5/21		125 mL HDPE Wide-Mouth Bottle	Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the Particulate Filter extraction.
C-2166 SemiWorks CB Outlet R1 OTM-45 XAD-2 Resin Tube	1	5/5/21		XAD-2 Resin Tube	XAD-2 Resin Tube OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Back-Half Glassware Rinse and the Impinger Glassware Methanol Rinse to assist the solvent extraction of the XAD-2 resin sample. Analyze for HFPO-DA using Method 8321A-HFPO.

Request for Analysis/Chain-of-Custody – RFA/COC #007
The Chemours Company – Fayetteville NC
SemiWorks Carbon Bed Outlet



Environment Testing
 TestAmerica

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Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
C-2167 SemiWorks CB Outlet R1 OTM-45 BH of Filter Holder & Coil Condenser Methanol Rinse (Combine with C-2166)	1	5/5/21		125 mL HDPE Wide-Mouth Bottle	Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction. Analyze for HFPO-DA using Method 8321A-HFPO.
C-2168 SemiWorks CB Outlet R1 OTM-45 Impingers 1,2 & 3 Condensate	1	5/5/21		500 mL HDPE Wide-Mouth Bottle	Impinger #1, #2 & #3 Condensate OTM-45 Train HFPO-DA Analysis	Knoxville: Analyze the sample for HFPO-DA.
C-2169 SemiWorks CB Outlet R1 OTM-45 Impinger Glassware MeOH Rinse (Combine with C-2166)	1	5/5/21		250 mL HDPE Wide-Mouth Bottle	Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the XAD-2 Resin Extraction.
C-2170 SemiWorks CB Outlet R1 OTM-45 Breakthrough XAD-2 Resin Tube	1	5/5/21		XAD-2 Resin Tube	Breakthrough XAD-2 Resin Tube OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level and perform the regular XAD-2 Resin Extraction. Analyze for HFPO-DA using Method 8321A-HFPO.
C-2171 SemiWorks CB Outlet R2 OTM-45 Filter (Combine with C-2172)	2	5/5/21		125 mL HDPE Wide-Mouth Bottle	Particulate Filter (82.6 mm Whatman Glass Microfiber) OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Front-Half Probe Rinse to assist the solvent extraction of the Particulate Filter sample. Analyze for HFPO-DA using Method 8321A-HFPO.
C-2172 SemiWorks CB Outlet R2 OTM-45 Front Half of Filter Holder & Probe Methanol Rinse (Combine with C-2171)	2	5/5/21		125 mL HDPE Wide-Mouth Bottle	Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the Particulate Filter extraction.

Request for Analysis/Chain-of-Custody – RFA/COC #007
The Chemours Company – Fayetteville NC
SemiWorks Carbon Bed Outlet



Environment Testing
 TestAmerica

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Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
C-2173 SemiWorks CB Outlet R2 OTM-45 XAD-2 Resin Tube	2	5/5/21		XAD-2 Resin Tube	XAD-2 Resin Tube OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Back-Half Glassware Rinse and the Impinger Glassware Methanol Rinse to assist the solvent extraction of the XAD-2 resin sample. Analyze for HFPO-DA using Method 8321A-HFPO.
C-2174 SemiWorks CB Outlet R2 OTM-45 BH of Filter Holder & Coil Condenser Methanol Rinse (Combine with C-2173)	2	5/5/21		125 mL HDPE Wide- Mouth Bottle	Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction. Analyze for HFPO-DA using Method 8321A-HFPO.
C-2175 SemiWorks CB Outlet R2 OTM-45 Impingers 1,2 & 3 Condensate	2	5/5/21		500 mL HDPE Wide- Mouth Bottle	Impinger #1, #2 & #3 Condensate OTM-45 Train HFPO-DA Analysis	Knoxville: Analyze the sample for HFPO-DA.
C-2176 SemiWorks CB Outlet R2 OTM-45 Impinger Glassware MeOH Rinse (Combine with C-2173)	2	5/5/21		250 mL HDPE Wide- Mouth Bottle	Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the XAD-2 Resin Extraction.
C-2177 SemiWorks CB Outlet R2 OTM-45 Breakthrough XAD- 2 Resin Tube	2	5/5/21		XAD-2 Resin Tube	Breakthrough XAD-2 Resin Tube OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level and perform the regular XAD-2 Resin Extraction. Analyze for HFPO-DA using Method 8321A-HFPO.
C-2178 SemiWorks CB Outlet R3 OTM-45 Filter (Combine with C-2179)	3	5/5/21		125 mL HDPE Wide- Mouth Bottle	Particulate Filter (82.6 mm Whatman Glass Microfiber) OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Front-Half Probe Rinse to assist the solvent extraction of the Particulate Filter sample. Analyze for HFPO-DA using Method 8321A-HFPO.

Request for Analysis/Chain-of-Custody – RFA/COC #007
The Chemours Company – Fayetteville NC
SemiWorks Carbon Bed Outlet



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Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
C-2179 SemiWorks CB Outlet R3 OTM-45 Front Half of Filter Holder & Probe Methanol Rinse (Combine with C-2178)	3	5/5/21		125 mL HDPE Wide-Mouth Bottle	Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the Particulate Filter extraction.
C-2180 SemiWorks CB Outlet R3 OTM-45 XAD-2 Resin Tube	3	5/5/21		XAD-2 Resin Tube	XAD-2 Resin Tube OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Back-Half Glassware Rinse and the Impinger Glassware Methanol Rinse to assist the solvent extraction of the XAD-2 resin sample. Analyze for HFPO-DA using Method 8321A-HFPO.
C-2181 SemiWorks CB Outlet R3 OTM-45 BH of Filter Holder & Coil Condenser Methanol Rinse (Combine with C-2180)	3	5/5/21		125 mL HDPE Wide-Mouth Bottle	Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction. Analyze for HFPO-DA using Method 8321A-HFPO.
C-2182 SemiWorks CB Outlet R3 OTM-45 Impingers 1,2 & 3 Condensate	3	5/5/21		500 mL HDPE Wide-Mouth Bottle	Impinger #1, #2 & #3 Condensate OTM-45 Train HFPO-DA Analysis	Knoxville: Analyze the sample for HFPO-DA.
C-2183 SemiWorks CB Outlet R3 OTM-45 Impinger Glassware MeOH Rinse (Combine with C-2180)	3	5/5/21		250 mL HDPE Wide-Mouth Bottle	Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the XAD-2 Resin Extraction.
C-2184 SemiWorks CB Outlet R3 OTM-45 Breakthrough XAD-2 Resin Tube	3	5/5/21		XAD-2 Resin Tube	Breakthrough XAD-2 Resin Tube OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level and perform the regular XAD-2 Resin Extraction. Analyze for HFPO-DA using Method 8321A-HFPO.

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Sample Receipt Log and Condition of the Samples Upon Receipt:

Please fill in the following information:

Comments

(Please write "NONE" if no comment applicable)

- (1) Record the identities of any samples that were listed on the RFA but were not found in the sample shipment. NONE
- (2) Record the sample shipping cooler temperature of all coolers transporting samples listed on this RFA: RT 0.4/CT0.5°C
- (3) Record any apparent sample loss/breakage. NONE
- (4) Record any unidentified samples transported with this shipment of samples: NONE
- (5) Indicate if all samples were received according to the project's required specifications (i.e. no nonconformances): HAND DELIVERED, NO CUSTODY SEALS

Custody Transfer:

Relinquished By:	<u>Patricia Brady</u> Name	<u>Alliance</u> Company	<u>5/7/21</u> Date/Time
Accepted By:	<u>Dorey Cabell</u> Name	<u>ETA KNOX</u> Company	<u>5/7/21 1820</u> Date/Time
Relinquished By:	<u>Dorey Cabell</u> Name	<u>ETA KNOX</u> Company	<u>5/8/21 1130</u> Date/Time
Accepted By:	<u>Ryan Lamm</u> Name	<u>ETA KNOX</u> Company	<u>5-8-21 11:30</u> Date/Time
Relinquished By:	_____ Name	_____ Company	_____ Date/Time
Accepted By:	_____ Name	_____ Company	_____ Date/Time
Relinquished By:	_____ Name	_____ Company	_____ Date/Time
Accepted By:	_____ Name	_____ Company	_____ Date/Time

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

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Are the shipping containers intact?	/			<input type="checkbox"/> Containers, Broken	
2. Were ambient air containers received intact?		/		<input type="checkbox"/> Checked in lab	
3. The coolers/containers custody seal if present, is it intact?		/		<input type="checkbox"/> Yes <input type="checkbox"/> NA	
4. Is the cooler temperature within limits? (> freezing temp. of water to 6°C, VOST: 10°C) Thermometer ID : <u>571</u> Correction factor: <u>+0.1°C</u>	/			<input type="checkbox"/> Cooler Out of Temp, Client Contacted, Proceed/Cancel <input type="checkbox"/> Cooler Out of Temp, Same Day Receipt	
5. Were all of the sample containers received intact?	/			<input type="checkbox"/> Containers, Broken	
6. Were samples received in appropriate containers?	/			<input type="checkbox"/> Containers, Improper; Client Contacted; Proceed/Cancel	
7. Do sample container labels match COC? (IDs, Dates, Times)	/			<input type="checkbox"/> COC & Samples Do Not Match <input type="checkbox"/> COC Incorrect/Incomplete <input type="checkbox"/> COC Not Received	
8. Were all of the samples listed on the COC received?	/			<input type="checkbox"/> Sample Received, Not on COC <input type="checkbox"/> Sample on COC, Not Received	
9. Is the date/time of sample collection noted?	/			<input type="checkbox"/> COC; No Date/Time; Client Contacted	Labeling Verified by: _____ Date: _____
10. Was the sampler identified on the COC?	/	/		<input type="checkbox"/> Sampler Not Listed on COC	pH test strip lot number: _____
11. Is the client and project name/# identified?	/	/		<input type="checkbox"/> COC Incorrect/Incomplete	
12. Are tests/parameters listed for each sample?	/	/		<input type="checkbox"/> COC No tests on COC	
13. Is the matrix of the samples noted?	/	/		<input type="checkbox"/> COC Incorrect/Incomplete	
14. Was COC relinquished? (Signed/Dated/Timed)	/	/		<input type="checkbox"/> COC Incorrect/Incomplete	Box 16A: pH Preservation Box 18A: Residual Chlorine
15. Were samples received within holding time?	/	/		<input type="checkbox"/> Holding Time - Receipt	Preservative: _____
16. Were samples received with correct chemical preservative (excluding Encore)?	/	/		<input type="checkbox"/> pH Adjusted, pH Included (See box 16A) <input type="checkbox"/> Incorrect Preservative	Lot Number: _____ Exp Date: _____ Analyst: _____
17. Were VOA samples received without headspace?	/	/		<input type="checkbox"/> Headspace (VOA only) <input type="checkbox"/> Residual Chlorine	Date: _____ Time: _____
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number: _____	/	/			
19. For 1613B water samples is pH<9?	/	/		<input type="checkbox"/> If no, notify lab to adjust	
20. For rad samples was sample activity info. Provided?	/	/		<input type="checkbox"/> Project missing info	
Project #: _____				PM Instructions: _____	

Sample Receiving Associate: [Signature] Date: 5-8-21

QA026R32.doc, 062719



ANALYTICAL REPORT

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

Laboratory Job ID: 140-23011-1

Client Project/Site: SemiWorks CB Inlet - OTM-45

For:

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

Attn: Michael Aucoin



Authorized for release by:
5/19/2021 3:56:18 PM

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

LINKS

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results through
TotalAccess

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www.eurofinsus.com/Env

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

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

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



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Definitions/Glossary

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

Qualifiers

LCMS

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Case Narrative

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

Job ID: 140-23011-1

Laboratory: Eurofins TestAmerica, Knoxville

Narrative

Job Narrative 140-23011-1

Sample Receipt

The samples were received on 5/8/2021 11:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.3° C.

LCMS

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

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

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

Sample results were calculated using the following equation:

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

Where:

DF = Instrument dilution factor

SF = Extraction Split Factor = (final volume of extract in the initial extraction batch / initial volume of extract in the "Split" batch)

For condensate, if less than the entire sample is extracted, the fraction of sample used replaces "1 sample"

Method 537 (modified): The required dilution factor for the following samples were higher than could be achieved by "in vial" dilution, as it would dilute out the Isotope Dilution Analytes (IDA): Q-2381,2382 SEMIWORKS CARBON BED INLET R1 OTM-45 FH (140-23011-1), Q-2388,2389 SEMIWORKS CARBON BED INLET R2 OTM-45 FH (140-23011-5) and Q-2395,2396 SEMIWORKS CARBON BED INLET R3 OTM-45 FH (140-23011-9). As such, the dilution was achieved by taking a subsample of the undiluted extract, adding sufficient solvent, and re-spiking the extract with IDA.

Method 537 (modified): The following samples were reported with elevated reporting limits for all analytes: Q-2381,2382 SEMIWORKS CARBON BED INLET R1 OTM-45 FH (140-23011-1), Q-2388,2389 SEMIWORKS CARBON BED INLET R2 OTM-45 FH (140-23011-5) and Q-2395,2396 SEMIWORKS CARBON BED INLET R3 OTM-45 FH (140-23011-9). The sample was analyzed at a dilution based on screening results.

Method 537 (modified): The following samples were reported with elevated reporting limits for all analytes: Q-2383,2384,2386 SEMIWORKS CARBON BED INLET R1 OTM-45 BH (140-23011-2), Q-2390,2391,2393 SEMIWORKS CARBON BED INLET R2 OTM-45 BH (140-23011-6) and Q-2397,2398,2400 SEMIWORKS CARBON BED INLET R3 OTM-45 BH (140-23011-10). The sample was analyzed at a dilution based on screening results.

Method 537 (modified): The required dilution factor for the following samples were higher than could be achieved by "in vial" dilution, as it would dilute out the Isotope Dilution Analytes (IDA): Q-2383,2384,2386 SEMIWORKS CARBON BED INLET R1 OTM-45 BH (140-23011-2), Q-2390,2391,2393 SEMIWORKS CARBON BED INLET R2 OTM-45 BH (140-23011-6) and Q-2397,2398,2400 SEMIWORKS CARBON BED INLET R3 OTM-45 BH (140-23011-10). As such, the dilution was achieved by taking a subsample of the undiluted extract, adding sufficient solvent, and re-spiking the extract with IDA.

Case Narrative

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

Job ID: 140-23011-1 (Continued)

Laboratory: Eurofins TestAmerica, Knoxville (Continued)

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

Organic Prep

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

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Detection Summary

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

**Client Sample ID: Q-2381,2382 SEMIWORKS CARBON BED
INLET R1 OTM-45 FH**

Lab Sample ID: 140-23011-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	29.4		0.247	0.143	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: Q-2383,2384,2386 SEMIWORKS CARBON
BED INLET R1 OTM-45 BH**

Lab Sample ID: 140-23011-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	11.3		0.160	0.140	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: Q-2385 SEMIWORKS CARBON BED INLET
R1 OTM-45 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-23011-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.179		0.0750	0.0124	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: Q-2387 SEMIWORKS CARBON BED INLET
R1 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-23011-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.00395		0.00160	0.00140	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: Q-2388,2389 SEMIWORKS CARBON BED
INLET R2 OTM-45 FH**

Lab Sample ID: 140-23011-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	142		0.988	0.573	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: Q-2390,2391,2393 SEMIWORKS CARBON
BED INLET R2 OTM-45 BH**

Lab Sample ID: 140-23011-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	82.0		1.60	1.40	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: Q-2392 SEMIWORKS CARBON BED INLET
R2 OTM-45 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-23011-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.613		0.0737	0.0122	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: Q-2394 SEMIWORKS CARBON BED INLET
R2 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-23011-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.0339		0.00160	0.00140	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: Q-2395,2396 SEMIWORKS CARBON BED
INLET R3 OTM-45 FH**

Lab Sample ID: 140-23011-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	43.2		0.250	0.145	ug/Sample	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Knoxville

Detection Summary

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

**Client Sample ID: Q-2397,2398,2400 SEMIWORKS CARBON
BED INLET R3 OTM-45 BH**

Lab Sample ID: 140-23011-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	18.3		1.60	1.40	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: Q-2399 SEMIWORKS CARBON BED INLET
R3 OTM-45 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-23011-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.0553	J	0.0737	0.0122	ug/Sample	1		537 (modified)	Total/NA

**Client Sample ID: Q-2401 SEMIWORKS CARBON BED INLET
R3 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-23011-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
HFPO-DA	0.00256		0.00160	0.00140	ug/Sample	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Knoxville

Client Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

Client Sample ID: Q-2381,2382 SEMIWORKS CARBON BED INLET R1 OTM-45 FH

Lab Sample ID: 140-23011-1

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	29.4		0.247	0.143	ug/Sample		05/10/21 13:24	05/15/21 21:29	1
Isotope Dilution	%Recovery	Qualifier	Limits						
¹³ C3 HFPO-DA	95		25 - 150						
							Prepared	Analyzed	Dil Fac
							05/10/21 13:24	05/15/21 21:29	1

Client Sample ID: Q-2383,2384,2386 SEMIWORKS CARBON BED INLET R1 OTM-45 BH

Lab Sample ID: 140-23011-2

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	11.3		0.160	0.140	ug/Sample		05/10/21 09:44	05/17/21 13:29	1
Isotope Dilution	%Recovery	Qualifier	Limits						
¹³ C3 HFPO-DA	97		25 - 150						
							Prepared	Analyzed	Dil Fac
							05/10/21 09:44	05/17/21 13:29	1

Client Sample ID: Q-2385 SEMIWORKS CARBON BED INLET R1 OTM-45 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-23011-3

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.179		0.0750	0.0124	ug/Sample		05/10/21 14:43	05/13/21 14:15	1
Isotope Dilution	%Recovery	Qualifier	Limits						
¹³ C3 HFPO-DA	104		25 - 150						
							Prepared	Analyzed	Dil Fac
							05/10/21 14:43	05/13/21 14:15	1

Client Sample ID: Q-2387 SEMIWORKS CARBON BED INLET R1 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-23011-4

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.00395		0.00160	0.00140	ug/Sample		05/10/21 09:44	05/17/21 13:55	1
Isotope Dilution	%Recovery	Qualifier	Limits						
¹³ C3 HFPO-DA	84		25 - 150						
							Prepared	Analyzed	Dil Fac
							05/10/21 09:44	05/17/21 13:55	1

Client Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

Client Sample ID: Q-2388,2389 SEMIWORKS CARBON BED INLET R2 OTM-45 FH

Lab Sample ID: 140-23011-5

Date Collected: 05/05/21 00:00
 Date Received: 05/08/21 11:30
 Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	142		0.988	0.573	ug/Sample		05/10/21 13:24	05/15/21 21:38	1
Isotope Dilution	%Recovery	Qualifier	Limits						
¹³ C3 HFPO-DA	104		25 - 150						
							Prepared	Analyzed	Dil Fac
							05/10/21 13:24	05/15/21 21:38	1

Client Sample ID: Q-2390,2391,2393 SEMIWORKS CARBON BED INLET R2 OTM-45 BH

Lab Sample ID: 140-23011-6

Date Collected: 05/05/21 00:00
 Date Received: 05/08/21 11:30
 Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	82.0		1.60	1.40	ug/Sample		05/10/21 09:44	05/17/21 14:04	1
Isotope Dilution	%Recovery	Qualifier	Limits						
¹³ C3 HFPO-DA	99		25 - 150						
							Prepared	Analyzed	Dil Fac
							05/10/21 09:44	05/17/21 14:04	1

Client Sample ID: Q-2392 SEMIWORKS CARBON BED INLET R2 OTM-45 IMPINGERS 1,2&3 COND

Lab Sample ID: 140-23011-7

Date Collected: 05/05/21 00:00
 Date Received: 05/08/21 11:30
 Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.613		0.0737	0.0122	ug/Sample		05/10/21 14:43	05/13/21 14:24	1
Isotope Dilution	%Recovery	Qualifier	Limits						
¹³ C3 HFPO-DA	110		25 - 150						
							Prepared	Analyzed	Dil Fac
							05/10/21 14:43	05/13/21 14:24	1

Client Sample ID: Q-2394 SEMIWORKS CARBON BED INLET R2 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE

Lab Sample ID: 140-23011-8

Date Collected: 05/05/21 00:00
 Date Received: 05/08/21 11:30
 Sample Container: Air Train

Matrix: Air

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0339		0.00160	0.00140	ug/Sample		05/10/21 09:44	05/17/21 14:13	1
Isotope Dilution	%Recovery	Qualifier	Limits						
¹³ C3 HFPO-DA	82		25 - 150						
							Prepared	Analyzed	Dil Fac
							05/10/21 09:44	05/17/21 14:13	1

Client Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

**Client Sample ID: Q-2395,2396 SEMIWORKS CARBON BED
 INLET R3 OTM-45 FH**

Lab Sample ID: 140-23011-9

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	43.2		0.250	0.145	ug/Sample		05/10/21 13:24	05/15/21 21:47	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	93		25 - 150				05/10/21 13:24	05/15/21 21:47	1

**Client Sample ID: Q-2397,2398,2400 SEMIWORKS CARBON
 BED INLET R3 OTM-45 BH**

Lab Sample ID: 140-23011-10

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	18.3		1.60	1.40	ug/Sample		05/10/21 09:44	05/17/21 14:31	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	108		25 - 150				05/10/21 09:44	05/17/21 14:31	1

**Client Sample ID: Q-2399 SEMIWORKS CARBON BED INLET
 R3 OTM-45 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-23011-11

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.0553	J	0.0737	0.0122	ug/Sample		05/10/21 14:43	05/13/21 14:50	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	108		25 - 150				05/10/21 14:43	05/13/21 14:50	1

**Client Sample ID: Q-2401 SEMIWORKS CARBON BED INLET
 R3 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-23011-12

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Sample Container: Air Train

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	0.00256		0.00160	0.00140	ug/Sample		05/10/21 09:44	05/17/21 14:39	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	79		25 - 150				05/10/21 09:44	05/17/21 14:39	1

Default Detection Limits

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Prep: None

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

1

2

3

4

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Isotope Dilution Summary

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Air

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	HFPODA (25-150)			
140-23011-1	Q-2381,2382 SEMIWORKS CAF	95			
140-23011-2	Q-2383,2384,2386 SEMIWORKS CARBON BED INLET R1 OTM-45 BH	97			
140-23011-3	Q-2385 SEMIWORKS CARBON BED INLET R1 OTM-45 IMPINGERS 1,2&3 COND	104			
140-23011-4	Q-2387 SEMIWORKS CARBON BED INLET R1 OTM-45 BREAKTHROUGH XAD-2 RESI TUBE	84			
140-23011-5	Q-2388,2389 SEMIWORKS CARBON BED INLET R2 OTM-45 FH	104			
140-23011-6	Q-2390,2391,2393 SEMIWORKS CARBON BED INLET R2 OTM-45 BH	99			
140-23011-7	Q-2392 SEMIWORKS CARBON BED INLET R2 OTM-45 IMPINGERS 1,2&3 COND	110			
140-23011-8	Q-2394 SEMIWORKS CARBON BED INLET R2 OTM-45 BREAKTHROUGH XAD-2 RESI TUBE	82			
140-23011-9	Q-2395,2396 SEMIWORKS CARBON BED INLET R3 OTM-45 FH	93			
140-23011-10	Q-2397,2398,2400 SEMIWORKS CARBON BED INLET R3 OTM-45 BH	108			
140-23011-11	Q-2399 SEMIWORKS CARBON BED INLET R3 OTM-45 IMPINGERS 1,2&3 COND	108			
140-23011-12	Q-2401 SEMIWORKS CARBON BED INLET R3 OTM-45 BREAKTHROUGH XAD-2 RESI TUBE	79			
LCS 140-49635/2-B	Lab Control Sample	90			
LCS 140-49653/2-B	Lab Control Sample	91			
LCS 140-49661/2-B	Lab Control Sample	102			
LCSD 140-49635/3-B	Lab Control Sample Dup	96			
LCSD 140-49653/3-B	Lab Control Sample Dup	95			
LCSD 140-49661/3-B	Lab Control Sample Dup	105			
MB 140-49635/14-B	Method Blank	90			
MB 140-49635/1-B	Method Blank	85			
MB 140-49653/1-B	Method Blank	92			
MB 140-49661/1-B	Method Blank	109			

Surrogate Legend

HFPODA = 13C3 HFPO-DA

QC Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 140-49635/14-B
Matrix: Air
Analysis Batch: 49885

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 49635

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00160	0.00140	ug/Sample		05/10/21 09:44	05/17/21 14:22	1
Isotope Dilution	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	90		25 - 150				05/10/21 09:44	05/17/21 14:22	1

Lab Sample ID: MB 140-49635/1-B
Matrix: Air
Analysis Batch: 49885

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 49635

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00160	0.00140	ug/Sample		05/10/21 09:44	05/17/21 12:10	1
Isotope Dilution	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	85		25 - 150				05/10/21 09:44	05/17/21 12:10	1

Lab Sample ID: LCS 140-49635/2-B
Matrix: Air
Analysis Batch: 49885

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 49635

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HFPO-DA	0.0200	0.02302		ug/Sample		115	60 - 140
Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits				
13C3 HFPO-DA	90		25 - 150				

Lab Sample ID: LCSD 140-49635/3-B
Matrix: Air
Analysis Batch: 49885

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 49635

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
HFPO-DA	0.0200	0.02216		ug/Sample		111	60 - 140	4	30
Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits						
13C3 HFPO-DA	96		25 - 150						

Lab Sample ID: MB 140-49653/1-B
Matrix: Air
Analysis Batch: 49858

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 49653

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.00100	0.000580	ug/Sample		05/10/21 13:24	05/15/21 20:36	1
Isotope Dilution	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	92		25 - 150				05/10/21 13:24	05/15/21 20:36	1

QC Sample Results

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

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

Lab Sample ID: LCS 140-49653/2-B
Matrix: Air
Analysis Batch: 49858

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 49653

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HFPO-DA	0.0200	0.02153		ug/Sample		108	60 - 140
<i>Isotope Dilution</i>		<i>%Recovery</i>	<i>Qualifier</i>				<i>Limits</i>
13C3 HFPO-DA		91					25 - 150

Lab Sample ID: LCSD 140-49653/3-B
Matrix: Air
Analysis Batch: 49858

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 49653

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA	0.0200	0.02108		ug/Sample		105	60 - 140	2	30
<i>Isotope Dilution</i>		<i>%Recovery</i>	<i>Qualifier</i>				<i>Limits</i>		
13C3 HFPO-DA		95					25 - 150		

Lab Sample ID: MB 140-49661/1-B
Matrix: Air
Analysis Batch: 49797

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 49661

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
HFPO-DA	ND		0.000500	0.0000825	ug/Sample		05/10/21 14:43	05/13/21 13:05	1
<i>Isotope Dilution</i>	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
13C3 HFPO-DA	109		25 - 150				05/10/21 14:43	05/13/21 13:05	1

Lab Sample ID: LCS 140-49661/2-B
Matrix: Air
Analysis Batch: 49797

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 49661

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
HFPO-DA	0.0100	0.01039		ug/Sample		104	60 - 140
<i>Isotope Dilution</i>		<i>%Recovery</i>	<i>Qualifier</i>				<i>Limits</i>
13C3 HFPO-DA		102					25 - 150

Lab Sample ID: LCSD 140-49661/3-B
Matrix: Air
Analysis Batch: 49797

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 49661

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
HFPO-DA	0.0100	0.01003		ug/Sample		100	60 - 140	3	30
<i>Isotope Dilution</i>		<i>%Recovery</i>	<i>Qualifier</i>				<i>Limits</i>		
13C3 HFPO-DA		105					25 - 150		

QC Association Summary

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

LCMS

Prep Batch: 49635

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23011-2	Q-2383,2384,2386 SEMIWORKS CARBON BED	Total/NA	Air	None	
140-23011-4	Q-2387 SEMIWORKS CARBON BED INLET R1	Total/NA	Air	None	
140-23011-6	Q-2390,2391,2393 SEMIWORKS CARBON BED	Total/NA	Air	None	
140-23011-8	Q-2394 SEMIWORKS CARBON BED INLET R2	Total/NA	Air	None	
140-23011-10	Q-2397,2398,2400 SEMIWORKS CARBON BED	Total/NA	Air	None	
140-23011-12	Q-2401 SEMIWORKS CARBON BED INLET R3	Total/NA	Air	None	
MB 140-49635/14-B	Method Blank	Total/NA	Air	None	
MB 140-49635/1-B	Method Blank	Total/NA	Air	None	
LCS 140-49635/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-49635/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Prep Batch: 49653

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23011-1	Q-2381,2382 SEMIWORKS CARBON BED INLE	Total/NA	Air	None	
140-23011-5	Q-2388,2389 SEMIWORKS CARBON BED INLE	Total/NA	Air	None	
140-23011-9	Q-2395,2396 SEMIWORKS CARBON BED INLE	Total/NA	Air	None	
MB 140-49653/1-B	Method Blank	Total/NA	Air	None	
LCS 140-49653/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-49653/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Prep Batch: 49661

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23011-3	Q-2385 SEMIWORKS CARBON BED INLET R1	Total/NA	Air	None	
140-23011-7	Q-2392 SEMIWORKS CARBON BED INLET R2	Total/NA	Air	None	
140-23011-11	Q-2399 SEMIWORKS CARBON BED INLET R3	Total/NA	Air	None	
MB 140-49661/1-B	Method Blank	Total/NA	Air	None	
LCS 140-49661/2-B	Lab Control Sample	Total/NA	Air	None	
LCSD 140-49661/3-B	Lab Control Sample Dup	Total/NA	Air	None	

Cleanup Batch: 49725

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23011-3	Q-2385 SEMIWORKS CARBON BED INLET R1	Total/NA	Air	Split	49661
140-23011-7	Q-2392 SEMIWORKS CARBON BED INLET R2	Total/NA	Air	Split	49661
140-23011-11	Q-2399 SEMIWORKS CARBON BED INLET R3	Total/NA	Air	Split	49661
MB 140-49661/1-B	Method Blank	Total/NA	Air	Split	49661
LCS 140-49661/2-B	Lab Control Sample	Total/NA	Air	Split	49661
LCSD 140-49661/3-B	Lab Control Sample Dup	Total/NA	Air	Split	49661

Cleanup Batch: 49746

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23011-1	Q-2381,2382 SEMIWORKS CARBON BED INLE	Total/NA	Air	Split	49653
140-23011-5	Q-2388,2389 SEMIWORKS CARBON BED INLE	Total/NA	Air	Split	49653
140-23011-9	Q-2395,2396 SEMIWORKS CARBON BED INLE	Total/NA	Air	Split	49653
MB 140-49653/1-B	Method Blank	Total/NA	Air	Split	49653
LCS 140-49653/2-B	Lab Control Sample	Total/NA	Air	Split	49653
LCSD 140-49653/3-B	Lab Control Sample Dup	Total/NA	Air	Split	49653

Cleanup Batch: 49764

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23011-2	Q-2383,2384,2386 SEMIWORKS CARBON BED	Total/NA	Air	Split	49635
140-23011-4	Q-2387 SEMIWORKS CARBON BED INLET R1	Total/NA	Air	Split	49635

Eurofins TestAmerica, Knoxville

QC Association Summary

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

LCMS (Continued)

Cleanup Batch: 49764 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23011-6	Q-2390,2391,2393 SEMIWORKS CARBON BED	Total/NA	Air	Split	49635
140-23011-8	Q-2394 SEMIWORKS CARBON BED INLET R2	Total/NA	Air	Split	49635
140-23011-10	Q-2397,2398,2400 SEMIWORKS CARBON BED	Total/NA	Air	Split	49635
140-23011-12	Q-2401 SEMIWORKS CARBON BED INLET R3	Total/NA	Air	Split	49635
MB 140-49635/14-B	Method Blank	Total/NA	Air	Split	49635
MB 140-49635/1-B	Method Blank	Total/NA	Air	Split	49635
LCS 140-49635/2-B	Lab Control Sample	Total/NA	Air	Split	49635
LCSD 140-49635/3-B	Lab Control Sample Dup	Total/NA	Air	Split	49635

Analysis Batch: 49797

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23011-3	Q-2385 SEMIWORKS CARBON BED INLET R1	Total/NA	Air	537 (modified)	49725
140-23011-7	Q-2392 SEMIWORKS CARBON BED INLET R2	Total/NA	Air	537 (modified)	49725
140-23011-11	Q-2399 SEMIWORKS CARBON BED INLET R3	Total/NA	Air	537 (modified)	49725
MB 140-49661/1-B	Method Blank	Total/NA	Air	537 (modified)	49725
LCS 140-49661/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	49725
LCSD 140-49661/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	49725

Analysis Batch: 49858

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23011-1	Q-2381,2382 SEMIWORKS CARBON BED INLE	Total/NA	Air	537 (modified)	49859
140-23011-5	Q-2388,2389 SEMIWORKS CARBON BED INLE	Total/NA	Air	537 (modified)	49859
140-23011-9	Q-2395,2396 SEMIWORKS CARBON BED INLE	Total/NA	Air	537 (modified)	49859
MB 140-49653/1-B	Method Blank	Total/NA	Air	537 (modified)	49746
LCS 140-49653/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	49746
LCSD 140-49653/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	49746

Cleanup Batch: 49859

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23011-1	Q-2381,2382 SEMIWORKS CARBON BED INLE	Total/NA	Air	Dilution	49746
140-23011-5	Q-2388,2389 SEMIWORKS CARBON BED INLE	Total/NA	Air	Dilution	49746
140-23011-9	Q-2395,2396 SEMIWORKS CARBON BED INLE	Total/NA	Air	Dilution	49746

Analysis Batch: 49885

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23011-2	Q-2383,2384,2386 SEMIWORKS CARBON BED	Total/NA	Air	537 (modified)	49886
140-23011-4	Q-2387 SEMIWORKS CARBON BED INLET R1	Total/NA	Air	537 (modified)	49764
140-23011-6	Q-2390,2391,2393 SEMIWORKS CARBON BED	Total/NA	Air	537 (modified)	49886
140-23011-8	Q-2394 SEMIWORKS CARBON BED INLET R2	Total/NA	Air	537 (modified)	49764
140-23011-10	Q-2397,2398,2400 SEMIWORKS CARBON BED	Total/NA	Air	537 (modified)	49886
140-23011-12	Q-2401 SEMIWORKS CARBON BED INLET R3	Total/NA	Air	537 (modified)	49764
MB 140-49635/14-B	Method Blank	Total/NA	Air	537 (modified)	49764
MB 140-49635/1-B	Method Blank	Total/NA	Air	537 (modified)	49764
LCS 140-49635/2-B	Lab Control Sample	Total/NA	Air	537 (modified)	49764
LCSD 140-49635/3-B	Lab Control Sample Dup	Total/NA	Air	537 (modified)	49764

Cleanup Batch: 49886

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-23011-2	Q-2383,2384,2386 SEMIWORKS CARBON BED	Total/NA	Air	Dilution	49764
140-23011-6	Q-2390,2391,2393 SEMIWORKS CARBON BED	Total/NA	Air	Dilution	49764
140-23011-10	Q-2397,2398,2400 SEMIWORKS CARBON BED	Total/NA	Air	Dilution	49764

Eurofins TestAmerica, Knoxville

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

**Client Sample ID: Q-2381,2382 SEMIWORKS CARBON BED
 INLET R1 OTM-45 FH**

Lab Sample ID: 140-23011-1

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	83 mL	49653	05/10/21 13:24	DWS	TAL KNX
Total/NA	Cleanup	Split			42 mL	10 mL	49746	05/12/21 09:53	DWS	TAL KNX
Total/NA	Cleanup	Dilution			40 uL	10000 uL	49859	05/15/21 18:33	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			49858	05/15/21 21:29	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: Q-2383,2384,2386 SEMIWORKS CARBON
 BED INLET R1 OTM-45 BH**

Lab Sample ID: 140-23011-2

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Cleanup	Dilution			100 uL	10000 uL	49886	05/17/21 10:49	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 13:29	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: Q-2385 SEMIWORKS CARBON BED INLET
 R1 OTM-45 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-23011-3

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.00667 Sample	10 mL	49661	05/10/21 14:43	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	49725	05/11/21 15:00	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49797	05/13/21 14:15	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: Q-2387 SEMIWORKS CARBON BED INLET
 R1 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-23011-4

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 13:55	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

**Client Sample ID: Q-2388,2389 SEMIWORKS CARBON BED
 INLET R2 OTM-45 FH**

Lab Sample ID: 140-23011-5

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	83 mL	49653	05/10/21 13:24	DWS	TAL KNX
Total/NA	Cleanup	Split			42 mL	10 mL	49746	05/12/21 09:53	DWS	TAL KNX
Total/NA	Cleanup	Dilution			10 uL	10000 uL	49859	05/15/21 18:33	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			49858	05/15/21 21:38	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: Q-2390,2391,2393 SEMIWORKS CARBON
 BED INLET R2 OTM-45 BH**

Lab Sample ID: 140-23011-6

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Cleanup	Dilution			10 uL	10000 uL	49886	05/17/21 10:49	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 14:04	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: Q-2392 SEMIWORKS CARBON BED INLET
 R2 OTM-45 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-23011-7

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.00678 Sample	10 mL	49661	05/10/21 14:43	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	49725	05/11/21 15:00	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49797	05/13/21 14:24	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: Q-2394 SEMIWORKS CARBON BED INLET
 R2 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-23011-8

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 14:13	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

**Client Sample ID: Q-2395,2396 SEMIWORKS CARBON BED
 INLET R3 OTM-45 FH**

Lab Sample ID: 140-23011-9

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	100 mL	49653	05/10/21 13:24	DWS	TAL KNX
Total/NA	Cleanup	Split			50 mL	10 mL	49746	05/12/21 09:53	DWS	TAL KNX
Total/NA	Cleanup	Dilution			40 uL	10000 uL	49859	05/15/21 18:33	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			49858	05/15/21 21:47	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: Q-2397,2398,2400 SEMIWORKS CARBON
 BED INLET R3 OTM-45 BH**

Lab Sample ID: 140-23011-10

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Cleanup	Dilution			10 uL	10000 uL	49886	05/17/21 10:49	JRC	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 14:31	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: Q-2399 SEMIWORKS CARBON BED INLET
 R3 OTM-45 IMPINGERS 1,2&3 COND**

Lab Sample ID: 140-23011-11

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			0.00678 Sample	10 mL	49661	05/10/21 14:43	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	49725	05/11/21 15:00	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49797	05/13/21 14:50	JRC	TAL KNX
Instrument ID: LCA										

**Client Sample ID: Q-2401 SEMIWORKS CARBON BED INLET
 R3 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE**

Lab Sample ID: 140-23011-12

Date Collected: 05/05/21 00:00

Matrix: Air

Date Received: 05/08/21 11:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 14:39	JRC	TAL KNX
Instrument ID: LCA										

Lab Chronicle

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

Client Sample ID: Method Blank

Lab Sample ID: MB 140-49635/14-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 14:22	JRC	TAL KNX

Instrument ID: LCA

Client Sample ID: Method Blank

Lab Sample ID: MB 140-49635/1-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 12:10	JRC	TAL KNX

Instrument ID: LCA

Client Sample ID: Method Blank

Lab Sample ID: MB 140-49653/1-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	49653	05/10/21 13:24	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	49746	05/12/21 09:53	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49858	05/15/21 20:36	JRC	TAL KNX

Instrument ID: LCA

Client Sample ID: Method Blank

Lab Sample ID: MB 140-49661/1-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	10 mL	49661	05/10/21 14:43	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	49725	05/11/21 15:00	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49797	05/13/21 13:05	JRC	TAL KNX

Instrument ID: LCA

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-49635/2-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 12:18	JRC	TAL KNX

Instrument ID: LCA

Eurofins TestAmerica, Knoxville

Lab Chronicle

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-49653/2-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	49653	05/10/21 13:24	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	49746	05/12/21 09:53	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49858	05/15/21 20:45	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample

Lab Sample ID: LCS 140-49661/2-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	10 mL	49661	05/10/21 14:43	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	49725	05/11/21 15:00	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49797	05/13/21 13:14	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-49635/3-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	360 mL	49635	05/10/21 09:44	DWS	TAL KNX
Total/NA	Cleanup	Split			180 mL	10 mL	49764	05/12/21 13:02	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49885	05/17/21 12:27	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-49653/3-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	50 mL	49653	05/10/21 13:24	DWS	TAL KNX
Total/NA	Cleanup	Split			25 mL	10 mL	49746	05/12/21 09:53	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49858	05/15/21 20:54	JRC	TAL KNX
Instrument ID: LCA										

Client Sample ID: Lab Control Sample Dup

Lab Sample ID: LCSD 140-49661/3-B

Date Collected: N/A

Matrix: Air

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	None			1 Sample	10 mL	49661	05/10/21 14:43	DWS	TAL KNX
Total/NA	Cleanup	Split			10 mL	10 mL	49725	05/11/21 15:00	DWS	TAL KNX
Total/NA	Analysis	537 (modified)		1			49797	05/13/21 13:22	JRC	TAL KNX
Instrument ID: LCA										

Laboratory References:

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

Eurofins TestAmerica, Knoxville

Accreditation/Certification Summary

Client: The Chemours Company FC, LLC
 Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

Laboratory: Eurofins TestAmerica, Knoxville

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

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

Method Summary

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

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

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

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

Sample Summary

Client: The Chemours Company FC, LLC
Project/Site: SemiWorks CB Inlet - OTM-45

Job ID: 140-23011-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
140-23011-1	Q-2381,2382 SEMIWORKS CARBON BED INLE R1 OTM-45 FH	Air	05/05/21 00:00	05/08/21 11:30	
140-23011-2	Q-2383,2384,2386 SEMIWORKS CARBON BED INLET R1 OTM-45 BH	Air	05/05/21 00:00	05/08/21 11:30	
140-23011-3	Q-2385 SEMIWORKS CARBON BED INLET R1 OTM-45 IMPINGERS 1,2&3 COND	Air	05/05/21 00:00	05/08/21 11:30	
140-23011-4	Q-2387 SEMIWORKS CARBON BED INLET R1 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE	Air	05/05/21 00:00	05/08/21 11:30	
140-23011-5	Q-2388,2389 SEMIWORKS CARBON BED INLE R2 OTM-45 FH	Air	05/05/21 00:00	05/08/21 11:30	
140-23011-6	Q-2390,2391,2393 SEMIWORKS CARBON BED INLET R2 OTM-45 BH	Air	05/05/21 00:00	05/08/21 11:30	
140-23011-7	Q-2392 SEMIWORKS CARBON BED INLET R2 OTM-45 IMPINGERS 1,2&3 COND	Air	05/05/21 00:00	05/08/21 11:30	
140-23011-8	Q-2394 SEMIWORKS CARBON BED INLET R2 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE	Air	05/05/21 00:00	05/08/21 11:30	
140-23011-9	Q-2395,2396 SEMIWORKS CARBON BED INLE R3 OTM-45 FH	Air	05/05/21 00:00	05/08/21 11:30	
140-23011-10	Q-2397,2398,2400 SEMIWORKS CARBON BED INLET R3 OTM-45 BH	Air	05/05/21 00:00	05/08/21 11:30	
140-23011-11	Q-2399 SEMIWORKS CARBON BED INLET R3 OTM-45 IMPINGERS 1,2&3 COND	Air	05/05/21 00:00	05/08/21 11:30	
140-23011-12	Q-2401 SEMIWORKS CARBON BED INLET R3 OTM-45 BREAKTHROUGH XAD-2 RESIN TUBE	Air	05/05/21 00:00	05/08/21 11:30	

Request for Analysis/Chain-of-Custody – RFA/COC #008
The Chemours Company – Fayetteville NC
Semi-Works Carbon Bed Inlet



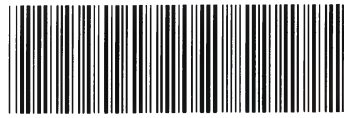
Environment Testing
 TestAmerica

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

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

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

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

Laboratory Deliverable Turnaround Requirements:	
Analytical Due Date: (Review-Released Data)	21 Days from Lab Receipt
Data Package Due Date:	 140-23011 Chain of Custody
Laboratory Destination:	TestAmerica Laboratories, Inc. 5815 Middlebrook Pike Knoxville, TN 37921
Lab Phone Number:	865.291.3000
Courier:	Hand Deliver

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Q-2381 SemiWorks Carbon Bed Inlet R1 OTM-45 Particulate Filter (Combine with Q-2382)	1	5/5/21		125 mL HDPE Wide- Mouth Bottle	Particulate Filter (82.6 mm Whatman Glass Microfiber) OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Front-Half Probe Rinse to assist the solvent extraction of the Particulate Filter sample. Analyze for HFPO-DA using method 8321A-HFPO.
Q-2382 SemiWorks Carbon Bed Inlet R1 OTM-45 FH of Filter Holder & Probe Methanol Rinse (Combine with Q-2381)	1	5/5/21		125 mL HDPE Wide- Mouth Bottle	Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the Particulate Filter extraction.
Q-2383 SemiWorks Carbon Bed Inlet R1 OTM-45 XAD- 2 Resin Tube	1	5/5/21		XAD-2 Resin Tube	XAD-2 Resin Tube OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Back-Half Glassware Rinse and the Impinger Glassware Methanol Rinse to assist the solvent extraction of the XAD-2 resin sample. Analyze for HFPO-DA using method 8321A-HFPO.

Request for Analysis/Chain-of-Custody – RFA/COC #008
The Chemours Company – Fayetteville NC
Semi-Works Carbon Bed Inlet



Environment Testing
 TestAmerica

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Q-2384 SemiWorks Carbon Bed Inlet R1 OTM-45 BH of Filter Holder & Coil Condenser Methanol Rinse (Combine with Q-2383)	1	5/5/21		125 mL HDPE Wide- Mouth Bottle	Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction.
Q-2385 SemiWorks Carbon Bed Inlet R1 OTM-45 Impingers 1,2 & 3 Condensate	1	5/5/21		500 mL HDPE Wide- Mouth Bottle	Impinger #1, #2 & #3 Condensate OTM-45 Train HFPO-DA Analysis	Knoxville: Analyze the sample for HFPO-DA.
Q-2386 SemiWorks Carbon Bed Inlet R1 OTM-45 Impinger Glassware MeOH Rinse (Combine with Q-2383)	1	5/5/21		250 mL HDPE Wide- Mouth Bottle	Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the XAD-2 Resin Extraction.
Q-2387 SemiWorks Carbon Bed Inlet R1 OTM-45 Breakthrough XAD-2 Resin Tube	1	5/5/21		XAD-2 Resin Tube	Breakthrough XAD-2 Resin Tube OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level and perform the regular XAD-2 Resin Extraction. Analyze for HFPO-DA using method 8321A-HFPO.
Q-2388 SemiWorks Carbon Bed Inlet R2 OTM-45 Particulate Filter (Combine with Q-2389)	2	5/5/21		125 mL HDPE Wide- Mouth Bottle	Particulate Filter (82.6 mm Whatman Glass Microfiber) OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Front-Half Probe Rinse to assist the solvent extraction of the Particulate Filter sample. Analyze for HFPO-DA using method 8321A-HFPO.

Request for Analysis/Chain-of-Custody – RFA/COC #008
The Chemours Company – Fayetteville NC
Semi-Works Carbon Bed Inlet



Environment Testing
 TestAmerica

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Q-2389 SemiWorks Carbon Bed Inlet R2 OTM-45 Front Half of Filter Holder & Probe Methanol Rinse (Combine with Q-2388)	2	5/5/21		125 mL HDPE Wide- Mouth Bottle	Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the Particulate Filter extraction.
Q-2390 SemiWorks Carbon Bed Inlet R2 OTM-45 XAD- 2 Resin Tube	2	5/5/21		XAD-2 Resin Tube	XAD-2 Resin Tube OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Back-Half Glassware Rinse and the Impinger Glassware Methanol Rinse to assist the solvent extraction of the XAD-2 resin sample. Analyze for HFPO-DA using method 8321A- HFPO. Analyze.
Q-2391 SemiWorks Carbon Bed Inlet R2 OTM-45 BH of Filter Holder & Coil Condenser Methanol Rinse (Combine with Q-2390)	2	5/5/21		125 mL HDPE Wide- Mouth Bottle	Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction.
Q-2392 SemiWorks Carbon Bed Inlet R2 OTM-45 Impingers 1,2 & 3 Condensate	2	5/5/21		500 mL HDPE Wide- Mouth Bottle	Impinger #1, #2 & #3 Condensate OTM-45 Train HFPO-DA Analysis	Knoxville: Analyze the sample for HFPO-DA.
Q-2393 SemiWorks Carbon Bed Inlet R2 OTM-45 Impinger Glassware MeOH Rinse (Combine with Q-2390)	2	5/5/21		250 mL HDPE Wide- Mouth Bottle	Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the XAD-2 Resin Extraction.



Request for Analysis/Chain-of-Custody – RFA/COC #008
The Chemours Company – Fayetteville NC
Semi-Works Carbon Bed Inlet



Environment Testing
 TestAmerica

Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Q-2394 SemiWorks Carbon Bed Inlet R2 OTM-45 Breakthrough XAD-2 Resin Tube	2	5/5/21		XAD-2 Resin Tube	Breakthrough XAD-2 Resin Tube OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level and perform the regular XAD-2 Resin Extraction. Analyze for HFPO-DA using method 8321A-HFPO.
Q-2395 SemiWorks Carbon Bed Inlet R3 OTM-45 Particulate Filter (Combine with Q-2396)	3	5/5/21		125 mL HDPE Wide-Mouth Bottle	Particulate Filter (82.6 mm Whatman Glass Microfiber) OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Front-Half Probe Rinse to assist the solvent extraction of the Particulate Filter sample. Analyze for HFPO-DA using method 8321A-HFPO.
Q-2396 SemiWorks Carbon Bed Inlet R3 OTM-45 Front Half of Filter Holder & Probe Methanol Rinse (Combine with Q-2395)	3	5/5/21		125 mL HDPE Wide-Mouth Bottle	Front Half of Filter Holder & Probe Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the Particulate Filter extraction.
Q-2397 SemiWorks Carbon Bed Inlet R3 OTM-45 XAD-2 Resin Tube	3	5/5/21		XAD-2 Resin Tube	XAD-2 Resin Tube OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level. Use the Back-Half Glassware Rinse and the Impinger Glassware Methanol Rinse to assist the solvent extraction of the XAD-2 resin sample. Analyze for HFPO-DA using method 8321A-HFPO.
Q-2398 SemiWorks Carbon Bed Inlet R3 OTM-45 BH of Filter Holder & Coil Condenser Methanol Rinse (Combine with Q-2397)	3	5/5/21		125 mL HDPE Wide-Mouth Bottle	Back Half of Filter Holder & Coil Condenser Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample and the Impinger Glassware Methanol Rinse in the XAD-2 Resin extraction. Analyze for HFPO-DA using method 8321A-HFPO.
Q-2399 SemiWorks Carbon Bed Inlet R3 OTM-45 Impingers 1,2 & 3 Condensate	3	5/5/21		500 mL HDPE Wide-Mouth Bottle	Impinger #1, #2 & #3 Condensate OTM-45 Train HFPO-DA Analysis	Knoxville: Analyze the sample for HFPO-DA.



Field Sample No./Sample Coding ID	Run No.	Sample Collection Date	Project QC Requirements	Sample Bottle/ Container	Sample Type/Analysis	Analytical Specifications
Q-2400 SemiWorks Carbon Bed Inlet R3 OTM-45 Impinger Glassware MeOH Rinse (Combine with Q-2397)	3	5/5/21		250 mL HDPE Wide- Mouth Bottle	Impinger Glassware Methanol/5% Ammonium Hydroxide Rinse OTM-45 Train HFPO-DA Analysis	Knoxville: Use this solvent sample in the XAD-2 Resin Extraction.
Q-2401 SemiWorks Carbon Bed Inlet R3 OTM-45 Breakthrough XAD-2 Resin Tube	3	5/5/21		XAD-2 Resin Tube	Breakthrough XAD-2 Resin Tube OTM-45 Train HFPO-DA Analysis	Knoxville: Spike sample with the Isotope Dilution Internal Standard (IDIS) at the regular level and perform the regular XAD-2 Resin Extraction. Analyze for HFPO-DA using method 8321A-HFPO.



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Sample Receipt Log and Condition of the Samples Upon Receipt:

Please fill in the following information:

Comments

(Please write "NONE" if no comment applicable)

- (1) Record the identities of any samples that were listed on the RFA but were not found in the sample shipment. NONE
- (2) Record the sample shipping cooler temperature of all coolers transporting samples listed on this RFA: RT 0.2/CT0.3c
- (3) Record any apparent sample loss/breakage. NONE
- (4) Record any unidentified samples transported with this shipment of samples: NONE
- (5) Indicate if all samples were received according to the project's required specifications (i.e. no nonconformances): NO CUSTODY SEALS, ^{3/21} RE HAND DELIVERED

Custody Transfer:

Relinquished By:	<u>Patricia [Signature]</u>	<u>Alliance</u>	<u>5/7/21</u>
	Name	Company	Date/Time
Accepted By:	<u>Dorey [Signature]</u>	<u>ETA KNOX</u>	<u>5/7/21 1820</u>
	Name	Company	Date/Time
Relinquished By:	<u>Dorey [Signature]</u>	<u>ETA KNOX</u>	<u>5/8/21 1130</u>
	Name	Company	Date/Time
Accepted By:	<u>[Signature]</u>	<u>ETA KNOX</u>	<u>5-8-21 11:30</u>
	Name	Company	Date/Time
Relinquished By:			
	Name	Company	Date/Time
Accepted By:			
	Name	Company	Date/Time
Relinquished By:			
	Name	Company	Date/Time
Accepted By:			
	Name	Company	Date/Time

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

Review Items	Yes	No	NA	If No, what was the problem?	Comments/Actions Taken
1. Are the shipping containers intact?	/			<input type="checkbox"/> Containers, Broken	
2. Were ambient air containers received intact?	/			<input type="checkbox"/> Checked in lab	
3. The coolers/containers custody seal if present, is it intact?	/			<input type="checkbox"/> Yes <input type="checkbox"/> NA	
4. Is the cooler temperature within limits? (> freezing temp. of water to 6°C, VOST: 10°C) Thermometer ID : <u>5671</u> Correction factor: <u>+0.1 c</u>	/			<input type="checkbox"/> Cooler Out of Temp, Client Contacted, Proceed/Cancel <input type="checkbox"/> Cooler Out of Temp, Same Day Receipt	
5. Were all of the sample containers received intact?	/			<input type="checkbox"/> Containers, Broken	
6. Were samples received in appropriate containers?	/			<input type="checkbox"/> Containers, Improper; Client Contacted; Proceed/Cancel	
7. Do sample container labels match COC? (IDs, Dates, Times)	/			<input type="checkbox"/> COC & Samples Do Not Match <input type="checkbox"/> COC Incorrect/Incomplete <input type="checkbox"/> COC Not Received	
8. Were all of the samples listed on the COC received?	/			<input type="checkbox"/> Sample Received, Not on COC <input type="checkbox"/> Sample on COC, Not Received	
9. Is the date/time of sample collection noted?	/			<input type="checkbox"/> COC; No Date/Time; Client Contacted	
10. Was the sampler identified on the COC?	/			<input type="checkbox"/> Sampler Not Listed on COC	
11. Is the client and project name/# identified?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
12. Are tests/parameters listed for each sample?	/			<input type="checkbox"/> COC No tests on COC	
13. Is the matrix of the samples noted?	/			<input type="checkbox"/> COC Incorrect/Incomplete	
14. Was COC relinquished? (Signed/Dated/Timed)	/			<input type="checkbox"/> COC Incorrect/Incomplete	
15. Were samples received within holding time?	/			<input type="checkbox"/> Holding Time - Receipt	
16. Were samples received with correct chemical preservative (excluding Encore)?	/			<input type="checkbox"/> pH Adjusted, pH Included (See box 16A) <input type="checkbox"/> Incorrect Preservative	
17. Were VOA samples received without headspace?	/			<input type="checkbox"/> Headspace (VOA only)	
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number:	/			<input type="checkbox"/> Residual Chlorine	
19. For 1613B water samples is pH<9?	/			<input type="checkbox"/> If no, notify lab to adjust	
20. For rad samples was sample activity info. Provided?	/			<input type="checkbox"/> Project missing info	
Project #:					
PM Instructions:					
Sample Receiving Associate:	<i>Randall</i>			Date: <u>5-8-21</u>	



Appendix D

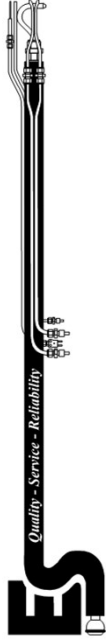
Location Ramboll - Chemours Fayetteville Works Facility, NC
 Source Semiworks Carbon Bed Outlet
 Project No. 2021-13240
 Parameter HFPO-DA

Date	Nozzle ID	Nozzle Diameter (in.)			Dn (Average)	Difference	Criteria	Material
		#1	#2	#3				
5/5/21	G-1	0.262	0.262	0.262	0.262	0.000	≤ 0.004 in.	glass
Date	Pitot ID	Evidence of damage?	Evidence of mis-alignment?	Calibration or Repair required?				
5/5/21	P4-1	no	no	no				
Date	Meter Box ID	Positive Pressure Leak Check						
5/5/21	11	Pass						

Location Ramboll - Chemours Fayetteville Works Facility, NC
 Source Semiworks Carbon Bed Inlet
 Project No. 2021-13240
 Parameter HFPO-DA

Date	Nozzle ID	Nozzle Diameter (in.)			Dn (Average)	Difference	Criteria	Material
		#1	#2	#3				
5/5/21	G-2	0.258	0.258	0.258	0.258	0.000	≤ 0.004 in.	glass
Date	Pitot ID	Evidence of damage?	Evidence of mis-alignment?	Calibration or Repair required?				
5/5/21	P4-3	no	no	no				
Date	Meter Box ID	Positive Pressure Leak Check						
5/5/21	7	Pass						

Pre-test Equipment Calibration Data



METHOD 5 DRY GAS METER CALIBRATION USING CRITICAL ORIFICES

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

DATE: 1/29/2021 METER SERIAL #: 7 INITIAL BAROMETRIC PRESSURE (in Hg): 29.69 FINAL AVG (P_{bar}): 29.69

METER PART #: 1393 CRITICAL ORIFICE SET SERIAL #: 1393

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT ³)		TEMPERATURES °F			ELAPSED TIME (MIN)	DGM DH (in H ₂ O)	V _m (STD)	V _c (STD)	Y % Diff to Average Y	Y % Diff with other orifices	DH ₀
				INITIAL	FINAL	NET (V _m)	AMBIENT	DGM INLET							
11	1	0.306	22	847.775	855.766	7.991	56	60	57	59	58	8.0014	0.989	1.78	
	2	0.306													
	3	0.306													
16	1	0.4268	20	855.766	861.315	5.549	54	58	58	57	57	5.5909	0.989	-0.19	
	2	0.4268											0.993	1.77	
	3	0.4268													
18	1	0.4961	20	861.315	867.774	6.459	54	58	59	57	58	6.4987	0.993	0.31	
	2	0.4961											0.991	1.76	
	3	0.4961													
26	1	0.7131	16	867.774	877.009	9.235	54	59	61	58	58	9.3414	0.991	-0.12	
	2	0.7131											0.995	1.84	
	3	0.7131													
31	1	0.8358	15.5	877.009	887.745	10.736	54	61	62	58	59	10.9487	1.002	0.36	
	2	0.8358											1.002	1.86	
	3	0.8358													

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

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

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

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

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

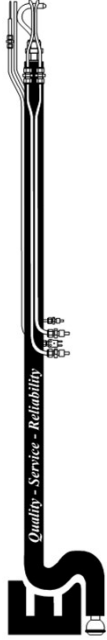
= Volume of gas sample passed through the critical orifice, corrected to standard conditions
 T_{amb} = Absolute ambient temperature (°R - English, °K - Metric)
 K' = Average K' factor from Critical Orifice Calibration

= DGM calibration factor

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = 0.994

AVERAGE DH₀ = 1.80

$$DH_0 = \left(\frac{0.75d}{V_c(std)} \right)^2 DH \left(\frac{V_m(std)}{V_m} \right)$$



METHOD 5 DRY GAS METER CALIBRATION USING CRITICAL ORIFICES

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

DATE: **1/13/2021** METER SERIAL #: **MB11** INITIAL AVG (P_{bar}) **29.78**
 METER PART #: **1393** CRITICAL ORIFICE SET SERIAL #: **1393** FINAL AVG (P_{bar}) **29.78**

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT ³)		TEMPERATURES °F			ELAPSED TIME (MIN)	DGM DH (in H ₂ O)	(1) V _m (STD)	(2) V _c (STD)	(3) Y	Y % Diff to Average Y	Y % Diff with other orifices	DH ₀
				INITIAL	FINAL	AMBIENT	DGM INLET	DGM INLET								
11	1	0.306														
	2	0.306	24	982.023	990.0	67	68	70	68	69	68.75	7.9414	1.000	0.84	1.54	1.56
	3	0.306														
16	1	0.4268														
	2	0.4268	23	990.0	995.653	65	69	70	70	70	69.75	5.5488	0.987	0.84	0.18	1.67
	3	0.4268														
18	1	0.4961														
	2	0.4961	22	995.653	1,002.250	63	70	70	70	71	70.25	6.4621	0.985	-0.69	-0.18	1.61
	3	0.4961														
26	1	0.7131														
	2	0.7131	19.5	2.250	11.645	62	70	72	71	71	71	9.2976	0.993	0.13	0.82	1.69
	3	0.7131														
31	1	0.8358														
	2	0.8358	18	11.645	22.587	67	71	74	71	72	72	10.8455	0.994	0.23	0.93	1.72
	3	0.8358														

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

$$(1) V_{m(crit)} = K_1 * V_m * \frac{P_{bar} + (\Delta H / 13.6)}{T_m}$$

$$(2) V_{c(crit)} = K_1 * \frac{P_{bar} * \Theta}{\sqrt{T_{amb}}}$$

$$(3) Y = \frac{V_{c(crit)}}{V_{m(crit)}}$$

= Net volume of gas sample passed through DGM, corrected to standard conditions
 K₁ = 17.64 °R/in. Hg (English), 0.3858 °K/mm Hg (Metric)
 T_m = Absolute DGM avg. temperature (°R - English, °K - Metric)

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

= DGM calibration factor

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = **0.992**

AVERAGE DH₀ = **1.65**

$$DH_0 = \left(\frac{0.75d}{V_{c(Std)}} \right)^2 DH \left(\frac{V_m(Std)}{V_m} \right)$$

Initial Sample Probe Calibration Form

 Probe ID P4-1/TC-7C

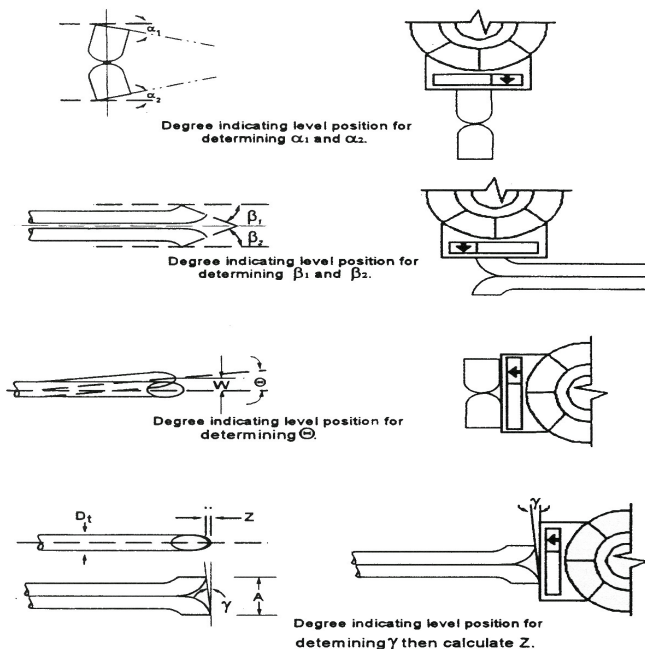
 Date 01/28/21

 Technician S. Waters

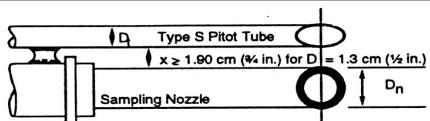
"S" Type Pitot Calibration

Is the Pitot Level and Perpendicular?	Yes
Is There any Obstruction?	No
Is the Pitot Damaged	No
α_1 (-10° = α_1 = + 10°)	1
α_2 (-10° = α_2 = + 10°)	0
β_1 (-5° = β_1 = + 5°)	1
β_2 (-5° = β_2 = + 5°)	1
γ	1
Θ	0
$Z = A \tan \gamma$ (< 0.125")	0.011
$W = A \tan \Theta$ (< 0.03125")	0.0000
D_t (3/16 = D_t = 3/8")	0.252
A	0.655
$A/2D_t$ (1.05 = P_A/D_t = 1.5)	1.300

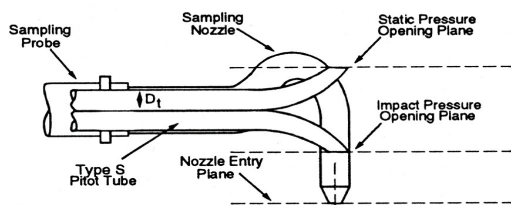
Source: Quality Assurance Handbook for Air Pollution Measurement Systems: Volume III, Stationary Source-Specific Methods. EPA/600/R-94/038c, September 30, 1994



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



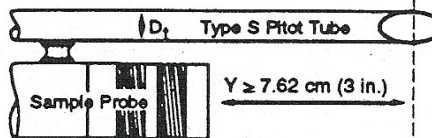
A. Bottom View; showing minimum pitot tube-nozzle separation.



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

Does X Exceed 0.75 inches? Yes

Does Y Exceed 3 inches? NA



Thermocouple Calibration

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

Temperature values must be within 1.5% of reference temperature

I certify that the probe ID P4-1/TC-7C meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube calibration factor C_p of 0.84.

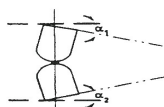
Certified By: S. Waters

Date: 01/28/21

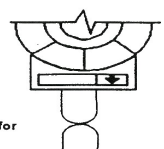
Initial Sample Probe Calibration Form

Probe ID P4-3/TC-7D Date 01/28/21 Technician S. Waters

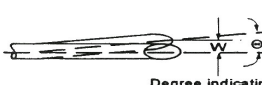
"S" Type Pitot Calibration	
Is the Pitot Level and Perpendicular?	Yes
Is There any Obstruction?	No
Is the Pitot Damaged	No
α_1 (-10° = α_1 = + 10°)	1
α_2 (-10° = α_2 = + 10°)	0
β_1 (-5° = β_1 = + 5°)	1
β_2 (-5° = β_2 = + 5°)	1
γ	1
Θ	1
$Z = A \tan \gamma$ (< 0.125")	0.011
$W = A \tan \Theta$ (< 0.03125")	0.0110
D_t (3/16 = D_t = 3/8")	0.251
A	0.628
$A/2D_t$ (1.05 = P_A/D_t = 1.5)	1.251
Source: Quality Assurance Handbook for Air Pollution Measurement Systems: Volume III, Stationary Source-Specific Methods. EPA/600/R-94/038c, September 30, 1994	



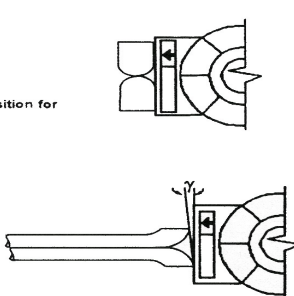
Degree indicating level position for determining α_1 and α_2 .



Degree indicating level position for determining β_1 and β_2 .

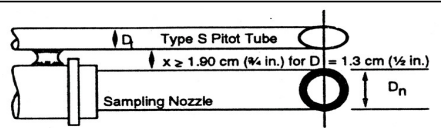


Degree indicating level position for determining Θ .



Degree indicating level position for determining γ then calculate Z.

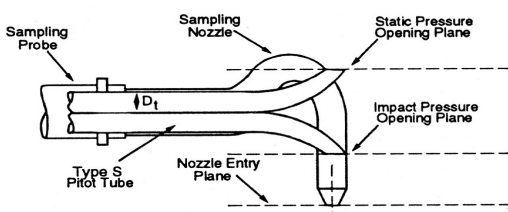
Verification of "S" Type Pitot, Thermocouple and Nozzle Placement



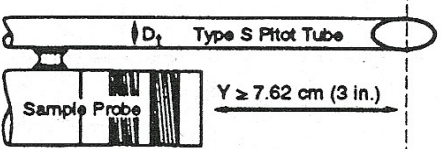
A. Bottom View; showing minimum pitot tube-nozzle separation.

Does X Exceed 0.75 inches? Yes

Does Y Exceed 3 inches? NA



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



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

	Ice Bath °R				Ambient °R				Boiling Water °R		
	1	2	3		1	2	3		1	2	3
Reference Temp	492	492	492		526	526	526		672	672	672
Thermocouple Temp	493	493	493		525	525	525		670	670	670
Difference (%)	0.2	0.2	0.2		-0.2	-0.2	-0.2		-0.3	-0.3	-0.3

Temperature values must be within 1.5% of reference temperature

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

Certified By: S. Waters

Date: 01/28/21

Post Test Equipment Calibration Data

POST TEST DRY GAS METER CALIBRATION

DATE: **05/26/21** METER BOX #: **7**
 TECHNICIAN: **S. Milo** CRITICAL ORIFICE SET SERIAL #: **1393**

BAROMETRIC PRESSURE (in Hg): **29.75** INITIAL **29.75** FINAL **29.75** AVG (P_{bar}) **29.75**

ORIFICE #	RUN #	K' FACTOR (AVG)	TESTED VACUUM (in Hg)	DGM READINGS (FT ³)		TEMPERATURES °F			ELAPSED TIME (MIN)	DGM DH (in H ₂ O)	(1) V _m (STD)	(2) V _c (STD)	(3) Y	Y % Diff to Average Y	DH®				
				INITIAL	FINAL	NET (V _m)	AMBIENT	DGM INLET								DGM OUTLET	DGM AVG		
	1																		
	2																		
	3																		
	AVG =																		
	1	0.4961	21.5	799.882	806.377	6.495	70	69	69	68	69	68.75	10.00	1.4	6.4725	6.4128	0.991	0.17	1.91
	2	0.4961	21.5	806.377	812.879	6.502	71	69	70	69	69	69.25	10.00	1.4	6.4733	6.4067	0.990	0.07	1.91
	3	0.4961	21.5	812.879	820.033	7.154	75	70	71	69	69	69.75	11.00	1.4	7.1157	7.0210	0.987	-0.24	1.92
	AVG =																		
	1																		
	2																		
	3																		
	AVG =																		

AVERAGE DRY GAS METER CALIBRATION FACTOR, Y = **0.989**

PRE-DETERMINED DRY GAS METER CALIBRATION FACTOR, Y = **0.994**

PERCENT DIFFERENCE = **-0.5**



Post-Test Sample Probe Calibration Form

Probe ID P4-1

Visual Inspection

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

Post-Test Thermocouple Calibration

Reference Temperature °F	Thermocouple Temperature °F	Difference °F
<u> 65.7 </u>	<u> 67 </u>	<u> 1.3 </u>

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

Acceptable Deviation +/- 2 °F

<u> X </u>	Acceptable
<u> </u>	Unacceptable

Date 05/26/21

Technician S. Milo

Post-Test Sample Probe Calibration Form

Probe ID P4-3

Visual Inspection

Do pitot tips appear to be damaged? NO
Do thermocouple wires appear broken or shorted? NO
Do all components appear to be in good condition? YES

Post-Test Thermocouple Calibration

Reference Temperature °F	Thermocouple Temperature °F	Difference °F
<u> 65.7 </u>	<u> 66.9 </u>	<u> 1.2 </u>

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

Acceptable Deviation +/- 2 °F

 X Acceptable
 Unacceptable

Date 05/26/21

Technician S. Milo

Appendix E

Last Page of Report