

Fact Sheet



For Final Minor Modification Permitting Action Under 45CSR30 and Title V of the Clean Air Act

This Fact Sheet serves to address the changes specific to this Minor Modification, and shall be considered a supplement to the Fact Sheet corresponding with the Title V operating permit issued on October 1, 2021.

Permit Number: **R30-10700182-2021**

Application Received: **September 30, 2022 (MM02)**

December 02, 2022 (MM03)

April 4, 2023 (MM04)

May 5, 2023 (MM05)

June 7, 2023 (MM06)

August 7, 2023 (MM08)

August 8, 2023 (MM09)

October 24, 2023 (MM10)

Plant Identification Number: **03-54-10700182**

Permittee: **The Chemours Company FC, LLC**

Facility Name: **Washington Works**

Business Unit: **Fluoropolymers (Part 2 of 14)**

Mailing Address: **P.O. Box 1217, Washington, WV 26181-1217**

Permit Action Number: *MM02 through MM10*

Revised: *May 21, 2024*

Physical Location:

Washington, Wood County, West Virginia

UTM Coordinates:

442.310 km Easting • 4,346.800 km Northing • Zone 17

Directions:

From I-77, take the Route 50 Bypass around Parkersburg towards Ohio. Take the last exit prior to the bridge exit from the Route 50 bypass on to DuPont Road. At the light turn left on to DuPont Road. Chemours Washington Works is approximately ½ mile on DuPont Road on the righthand side.

Facility Description

Within the Fluoropolymers Business Unit, there are the following Fluoroproduct production areas: C1, C2, C3, T1-T4 and T7, T5, and T6. Each area produces a product or family of products by varying operating conditions and small adjustments to raw material ratios or material feed rates. The following is a general description of the operations in each of the Fluoroproduct production areas within the Fluoropolymers Business Unit.

C1 Area

Within the "C1" area of Chemours Washington Works is a process capable of producing a variety of products in dispersion, flake and cube form. These products are made from fluoromonomers produced at the Washington Works Facility along with monomers from outside sources. The main product from this process is TEFLON® PFA.

C2 Area

The C2 Area manufactures fluoropolymer resins by precharging fluoromonomers into reactors along with demineralized water. Aqueous solutions of catalyst salts are then pumped into the reactors to initiate polymerization. Additional fluoromonomers are fed into the reactors as the reaction proceeds. Unreacted fluoromonomers are vented to recycling facilities at the end of the reaction. The remaining fluoropolymer and water slurry is pumped to agglomerators that mechanically separate the fluoropolymer from the water. Alternatively, the reactor output may be sent to facilities which concentrate the dispersion to higher solids and package the dispersion for sale. From the agglomerators, the polymer is conveyed to devices where water and other low boiling compounds are removed prior to extrusion. The polymer is then converted to pellets via an extrusion process. The pellets are hot air sparged to remove additional traces of miscellaneous volatile fluorocarbons, elutriated to remove traces of polymer fines and packaged for distribution

C3 Area

The C3 area manufactures various molecular weight Telomers, which are short, straight chain carbon-fluorine compounds. Telomer products are most commonly made up of the short chain compounds with four to fourteen carbons. There are several recipes, one of which is selected to make a desired product. All recipes perform similarly in that:

- Lower molecular weight (MW) Telomers are added to a reactor.
- Monomer and other raw materials are added and reacted to form more lower MW Telomers and to convert lower MW Telomers to higher MW Telomers.
- At the end of reaction, the reaction mass is transferred to distillation which is used to separate the different MW Telomers. Lower MW Telomers are put into hold tanks for re-use in the reactor. Higher MW Telomers remain in the distillation pot and become Telomer product.
- The Telomer product is filtered and transferred to product storage tanks.
- The finished Telomer product is loaded into tank trailers for shipment.

T1-T4, and T7 Areas

The T1-T4, and T7 areas produce final products fluoromonomers tetrafluoroethylene (TFE) and hexafluoropropylene (HFP); an intermediate, perfluorocyclobutane; and byproducts hydrogen chloride (HCl, aqueous) and calcium fluoride (CaF₂, solid). The production facility is divided into the following sections: T1-TFE Synthesis, T2-TFE Refining, T3-HFP Synthesis, T4-HFP Refining, and T7-Utilities.

Fluorocarbons are reacted by pyrolysis in the T1 area and the products are separated to form crude TFE and recovered byproducts. TFE is refined in the T2 area. In-process materials and intermediates are reacted by pyrolysis in the T3 area to form crude HFP that is then refined in the T4 area.

The T7 area is comprised of several utilities, including: refrigeration and cold brine supply; the unit vacuum systems for maintenance clearing of equipment; waste acid neutralization; and the thermal converter. The thermal converter combusts fluorine-containing byproduct gases from the T1-T4 process areas and from polymerization operations in the C1, C2, C3, and T6 areas; and from two different non-hazardous fluorine-containing liquid streams to produce aqueous hydrogen fluoride (HF) which is reacted with slaked lime (calcium oxide or CaO) to form CaF₂.

T5 Area

The T5 area produces fluoropolymer resin. The basic processes used are polymerization, drying, and modification. The resin is produced by water based emulsion polymerization in one of two reactor units. Water, monomer (primarily tetrafluoroethylene), process aids, and other minor ingredients are introduced to the reactor. The reaction starts under elevated pressure, but proceeds to an endpoint at sub-ambient pressure. The resin is removed as slurry and is stored in one of several tanks pending further treatment and drying. The polymer slurry is processed and dried. The wet polymer passes through one of two dryers. Emissions from either dryer pass through cyclone separators to recover particulate matter. Both cyclone systems employ a water spray to improve effectiveness. The material recovered from the cyclones is returned to the process. Dried resin is transferred to a pack-out room where it is drummed using automated equipment. Air from the pack-out room is exhausted through a scrubber. The recovered material from the pack-out exhaust is not recycled to the process.

T6 Area

The Teflon® T6 area produces TFE based homopolymers in four agitated batch reactors. The reaction takes place in an aqueous medium, and a milk white raw polymer dispersion in water is produced. A portion of the raw dispersion production is dried and sold as powder, and a portion is processed and sold as a finished aqueous dispersion.

Copolymer dispersion products are also made. A batch is started by adding water and other ingredients to the reactor. Polymerization takes place in the aqueous phase at high temperature and pressure. At the end of each batch, most of the unreacted material is recycled for reuse or sent to the thermal converter. Some products are made by partially concentrating the reactor output in a water/solids separation vessel where some of the water is removed. For product sold as fine powder, the material is dried at high temperature with subsequent removal of impurities. The dried product is cooled and packaged.

Emissions Summary

This combination of minor modifications results in the following emission changes:

Pollutant	Change in Potential Emissions (tpy)
Volatile Organic Compounds (VOC)	27.00
Particulate Matter (PM ₁₀)	4.96
HAP(includes HF)	2.46
Nitric Acid	0.12
Hydrogen Fluoride	1.64

Title V Program Applicability Basis

With the proposed changes associated with this modification, this facility maintains the potential to emit over 100 tons per year of criteria pollutants, over 10 tons per year of an individual HAP, and over 25 tons per year aggregate HAPs. Therefore, Chemours Washington Works is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30.

Legal and Factual Basis for Permit Conditions

The State and Federally-enforceable conditions of the Title V Operating Permits are based upon the requirements of the State of West Virginia Operating Permit Rule 45CSR30 for the purposes of Title V of the Federal Clean Air Act and the underlying applicable requirements in other state and federal rules.

The modification to this facility has been found to be subject to the following applicable rules:

Federal and State:	45CSR7	To Prevent and Control Particulate Matter Air Pollution From Manufacturing Processes And Associated Operations
	45CSR13	Preconstruction permits for minor sources.
	45CSR18	Prevent and control emissions from Commercial and Industrial Solid Waste Incineration Units (CISWI)
	45CSR30	Operating permit requirement.
	45CSR34	Emission Standards for Hazardous Air Pollutants
	40CFR63 Subpart FFFF	MON MACT
State Only:	N/A	

Each State and Federally-enforceable condition of the Title V Operating Permit references the specific relevant requirements of 45CSR30 or the applicable requirement upon which it is based. Any condition of the Title V permit that is enforceable by the State but is not Federally-enforceable is identified in the Title V permit as such.

The Secretary's authority to require standards under 40 C.F.R. Part 60 (NSPS), 40 C.F.R. Part 61 (NESHAPs), and 40 C.F.R. Part 63 (NESHAPs MACT) is provided in West Virginia Code §§ 22-5-1 *et seq.*, 45CSR16, 45CSR34 and 45CSR30.

Active Permits/Consent Orders

The active permits/consent orders affected by this modification are as follows:

Permit or Consent Order Number	Date of Issuance	Permit Determinations or Amendments That Affect the Permit (<i>if any</i>)
R13-2365T	November 16, 2023	
R13-0815N	March 17, 2023	
R13-1823Q	February 6, 2024	
R13-1953M	October 26, 2023	

Conditions from this facility's Rule 13 permit(s) governing construction-related specifications and timing requirements will not be included in the Title V Operating Permit but will remain independently enforceable under the applicable Rule 13 permit(s). All other conditions from this facility's Rule 13 permit(s) governing the source's operation and compliance have been incorporated into this Title V permit in accordance with the "General Requirement Comparison Table," which may be downloaded from DAQ's website.

Determinations and Justifications

C1 Area Changes (MM02, MM04, and MM08)

Changes to the C1 Area include minor modification MM02 (based on changes approved under R13-2365O and subsequently revised under Class I administrative update R13-2365P); MM04 based on changes approved under R13-2365Q; MM08 based on changes approved under R13-2365S and subsequently revised under Class I administrative update R13-2365T. R13-2365R and MM07 were withdrawn. As a result of these changes, the following revisions were made to the Title V permit:

- In Section 1.1 Emissions Units table, Emission Control Device C1FSC4 scrubber was added to the control devices of Emission Unit ID C1FS.
- In Section 1.1 Emission Units table, the existing Emission Control Device ID for C1GQC was changed to C1GQC1.
- In Section 1.1 Emission Units table, Emission Control Device C1GQC2 filter was added to the control devices of Emission Unit C1GQ.
- In Section 1.1 Emission Units table, Emission Units C1MB, C1NB, C1NC, C1ND, C1NE, C1NG, C1NH, C1PA, C1NF, C1PC, C1PD, C1PE, C1PF, C1PG, C1PB, C1PH, C1PI, C1PK, C1PJ, C1PM, C1PL, C1PN, C1PU, C1PO, C1PP, C1PQ, C1PR, C1PS, C1PT, and C1QE were added for the new finishing process referred to as PFA Line 2.
- In Section 4.1, Table 4.1.1 Emission Limits, the annual emission limits for PM₁₀ and VOC for C1FCE, C1GAE, C1GBE, and C1GCE were increased.
- In Section 4.1, Table 4.1.1 Emission Limits, the annual emission limits for VOC and ODC for C1FQE were increased.
- In Section 4.1, Table 4.1.1 Emission Limits, the emission limits for C1FRE were removed. According to condition 4.1.4, this emission source does not have emissions.
- In Section 4.1, Table 4.1.1 Emission Limits, the emission limits for VOC from C1FSE were revised. Also scrubber C1FSC4 was added as a control device for the dryer C1FS.
- In Section 4.1, Table 4.1.1 Emission Limits, the annual PM₁₀ emission limits for C1FUE were increased.

- In Section 4.1, Table 4.1.1 Emission Limits, the emission limits for C1FVE1 were revised.
- In Section 4.1, Table 4.1.1 Emission Limits, the annual emission limits for VOC and HF From C1FVE2 were revised.
- In Section 4.1, Table 4.1.1 Emission Limits, the annual VOC emission limits were revised and PM₁₀ emission limits were added for C1GDE.
- In Section 4.1, Table 4.1.1 Emission Limits, emission limits were added for C1GFE, C1MBE, C1NBE, C1NCE, C1NFE, C1NGE, C1PGE, C1PHE, C1PIE, C1PME, C1PNE, C1GRE, C1POE, C1PPE, C1PQE, C1PRE, C1PSE, C1QEE, C1PTE, C1PLE, C1PCE, C1NFE, C1NPE
- In Section 4.1, Table 4.1.1 Emission Limits, the PM₁₀ emission limits for C1GPE were revised.
- In Section 4.1, Table 4.1.1 Emission Limits, C1GQC2 (filter) was added as a control device for C1GQE.
- In Section 4.1, Table 4.1.1 Emission Limits, the 1st row for Emission Point C1GRE was deleted because it is included on the next page.
- In Section 4.1, Table 4.1.1 Emission Limits, the annual emission limits for PM₁₀ from C1GVE were increased.
- In Section 4.1, Table 4.1.1 Emission Limits, the emission limits for C1NPE were revised and moved to the end of the table.
- Particulate matter emission points C1GDE, C1PGE, C1PHE, C1PIE, C1PME, C1PNE, C1POE, C1PPE, C1PQE, C1PRE, C1PSE, and C1PLE were added to condition 4.1.1, 4.1.6, and 4.1.7.
- In Section 4.2.2, control devices C1GQC2, C1PHC, C1PLC, C1PGC1, C1FSC4, C1PGC2, C1NFC, C1PNC, C1NGC, C1PCC, and C1PGC3 were added.
- In Section 4.2.2, the word ‘upstream’ was replaced with the word ‘feedstream’ for clarification.
- In Section 4.2.2, C1FSC4, C1GQC2, C1NFC, C1NGC, and C1PGC1/C1PGC2 were added to 4.2.2 Table 4.2.2.(a).
- In Section 4.2.2, C1FSC4, C1GQC2, C1NGC, C1PGC1/C1PGC2, C1PGC3, C1PHC, C1PLC, and C1NFC were added to 4.2.2 Table 4.2.2 (b).
- The recordkeeping forms in Appendix A were updated based on the changes to equipment in the C1 Area.

MM02 Emmission Changes (including R13-2365P)

Overall Emission Increase Due to Modification	Change (tpy)
VOCs	1.62
PM ₁₀ /PM _{2.5}	2.33
Total Hydrocarbon	0.93
Nitric Acid	0.02
Ammonium Hydroxide	7.2E-6
Hydrogen Fluoride	1.64

MM04 (based on changes approved under R13-2365Q)

Pollutant	Change in Emissions, TPY
VOC	-0.15

MM08 (based on changes approved under R13-2365S)

Pollutant	Change in Emissions, TPY
VOC	15.98
PM ₁₀	1.29
Hazardous Air Pollutants (HAPs) (Hydrogen Fluoride & Acetonitrile)	0.8
Nitric Acid	0.10

T6 Area Change (MM03)

Changes to the T6 Area include minor modification MM03 based on changes approved under R13-0815N.

- Emission Unit T6SL was added to Section 1.1 Emission Units table.
- Section 9.1.5 has been changed as shown in the table below (red with strikethrough indicates deleted; red with underline indicates added):

Emission Point	Source Description	Control Device	Pollutant	Emission Limit	
				Hourly (pph) ¹	Annual (tpy)
Area	T6PI (Feed System)	None	Acetonitrile (107-13-1) VOC	0.01 <u>17.86</u>	0.001 0.42 <u>1.09</u>
T6IUE	T6IL (#4 Wt. Tank) T6PB (Feed System) T6PI (Feed System) T6IU (Reactor #9) T6QM (#9 Zinc Chloride Tank) T6PJ (Raw Material System) T5HM (Monomer System)	None	VOC ODC Acetonitrile (107-13-1) Toluene (108-88-3)	122.50 0.36 0.01 0.01	12.36 <u>18.42</u> 0.49 0.01 0.01
<u>T6PGE</u>	<u>T6QG (Feed Tank)</u> <u>T6QH (Feed Tank)</u>	<u>None</u>	<u>VOC</u> <u>ODC</u> <u>HAP</u>	<u>0.87</u> <u>0.01</u> <u>0.01</u>	<u>1.52</u> <u>0.01</u> <u>0.01</u>

T6SJE	T6YSJ (Solid-liquid separation tank)	None	VOC ODC Acetonitrile	0.14 <u>0.87</u> <u>0.01</u> <u>0.01</u>	0.24 <u>0.16</u> <u>0.01</u> <u>0.01</u>
<u>T6SLE</u>	<u>T6SL Container Loading</u>	<u>None</u>	<u>VOC</u>	<u>0.41</u>	<u>0.57</u>

- Since R13-0815N was issued in the new NSR boilerplate, the R13-0815 citations were revised in Sections 3.0 and 9.0 of the Title V permit.

Overall Emission Increase Due to Modification	Change (tpy)
VOCs	8.99
HAP	0.02
ODC	0.01

T1, T2, T3, T4, and T7 Area Changes (MM05, MM06, MM10)

Changes to the T1, T2, T3, T4, and T7 Area include minor modification MM05 based on changes approved under R13-1823O; MM06 based on changes approved under R13-1823P; and MM10 based on changes approved under R13-1823Q. As a result of these changes, the following revisions were made to the Title V permit:

- The following section has been included in the permit.
 - 3.1.23. In accordance with the provisions of the Consent Decree in U.S. v. E.I. DuPont De Nemours And Company, Civil Action No. 6:13-cv-27030 (S.D. W.Va.), including the definition in Paragraph 7 of the Consent Decree where applicable, Chemours shall do the following.
 - a. Maintain the LDAR Manual as required by Paragraph C of Attachment A of the above referenced Consent Decree.
 - b. Review the LDAR Manual annually and update as needed as stated in Paragraph G of Attachment A of the above referenced Consent Decree.
 - c. Adhere to the Enhanced LDAR Program (ELP), specifically referenced in Section I of Attachment B of the above referenced Consent Decree.

[45CSR§13-5.10.]

- 7.1.11 was deleted from the permit. The commercial industrial solid waste incinerator (CISWI) (T7IME) is exempt from 45 CSR 6 because the CISWI is subject to 45CSR18 (45CSR§6-10.1.a).
- Reference to T7IME in section 7.2.1 was deleted. The CISWI (T7IME) is subject to 45CSR18 and exempt from 45CSR6 and 45CSR7 is not applicable to thermal destruction units.
- In Section 7.2.2. of the permit, the operating limits were changed to the operating limits established during the most recent performance test.

Operating Parameter	Average Rate Measured During Compliance Testing	CISWI Operating Limit	Test Date Establishing Limit
Maximum charge rate	674 <u>773.6</u> lb/hr	741 <u>850.0</u> lb/hr	July 24-25, 2019 <u>August 15-16, 2023</u>
Minimum scrubber liquor flow rate	38 <u>40.7</u> gpm	38 <u>40.7</u> gpm	July 24-25, 2019 <u>August 15-16, 2023</u>
Minimum scrubber liquor pH	7 <u>7.0</u>	7 <u>7.0</u>	July 24-25, 2019 <u>August 15-16, 2023</u>

- In the table in section 7.2.7 of the permit, operating limits were changed to the operating limits established during the most recent performance test.

Thermal Converter – Scrubber (T7IMC)	Monitoring Frequency	Limit
Minimum Scrubber Effluent pH	Continuous	7 <u>7.0</u>
Minimum Scrubber Influent Liquor Flow	Continuous	40 <u>40.7</u> gpm
Maximum Gas Stream Flow	Continuous	12,700 <u>10,499.1</u> pph

- Section 7.3.1 Testing Requirements were updated in accordance with the revised 45CSR18 Section 9.9.z.

C2 Area Changes (MM09)

Changes to the C2 Area include minor modification MM09 based on changes approved under R13-1953M.

- In Table 1.1 Emission Units, C2KOE2 was deleted since this unit has been abandoned in place.
- In Table 5.1.1. the PM₁₀ limits for Emission Point C2ENE were changed from 0.40 pph to 0.56 pph and from 1.10 tpy to 1.69 tpy.
- In Table 5.1.1. the PM₁₀ limit for Emission Point C2ERE was changed from 2.73 tpy to 3.42 tpy.
- In Table 5.1.1. the PM₁₀ limit for Emission Point C2KPE was changed from 0.11 tpy to 0.17 tpy.
- In Table 5.1.1. the PM₁₀ limits for Emission Point C2EUE were changed from 0.01 pph to 0.02 pph and 0.01 tpy to 0.02 tpy.
- In Table 5.1.2. the VOC annual limit for Emission Point C2DHE was changed from 0.50 tpy to 0.49 tpy. There was another row for this emission point, C2DHE, having limits of 3.25 lbs/hr and 0.13 tpy, that was a repeat with limits that are not applicable. This row has therefore been deleted.
- In Table 5.1.2. the VOC limit for Emission Point C2DTE was changed from 2.75 tpy to 3.31 tpy.
- In Table 5.1.2. the VOC limit for Emission Point C2EBE was changed from 0.01 pph to 0.06 pph.
- In Table 5.1.3. the HF limit for Emission Point C2DHE was changed from 0.02 pph to 0.03 pph. The repeated row for C2DHE was deleted.
- Section 5.2.3. was deleted and changed to Reserved. The facility no longer has intermittent sources.

- Section 5.5.1. was deleted and changed to Reserved due to Section 5.2.3 being deleted.
- Emission Points C2KLE, and C2KNE were deleted for Attachment C because they have no potential to emit VOCs.
- Emission Point C2DHE was listed twice in Attachment B – Monthly Emissions and Attachment C- Annual Emissions VOC and HF tables, so one of those rows has been deleted.

Pollutant	Change in Emissions, TPY
VOC	0.56
PM ₁₀	1.34

Non-Applicability Determinations

None

Request for Variances or Alternatives

None

Insignificant Activities

Insignificant emission unit(s) and activities are identified in the Title V application.

Comment Period

Beginning Date: Not Applicable
Ending Date: N/A

Point of Contact

All written comments should be addressed to the following individual and office:

Jonathan Carney
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street SE
Charleston, WV 25304
304/926-0499 ext. 41247
Jonathan.W.Carney@wv.gov

Procedure for Requesting Public Hearing

During the public comment period, any interested person may submit written comments on the draft permit and may request a public hearing, if no public hearing has already been scheduled. A request for public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. The Secretary shall grant such a request for a hearing if he/she concludes that a public hearing is appropriate. Any public hearing shall be held in the general area in which the facility is located.

Response to Comments (Statement of Basis)

On April 9, 2024, Brandon Perdue of The Chemours Company, FC LLC – Washington Works made the following comments:

Comment 1:

For the fact sheet – modify the statement “In Table 5.1.2. the VOC limits for Emission Point C2DHE were changed from 3.25 pph to 0.11 pph and 0.13 tpy to 0.49 tpy. There was another row for this emission point, C2DHE, that was a repeat and therefore deleted” to “In Table 5.1.2, the VOC limit for Emission Point C2DHE was changed from 0.50 tpy to 0.49 tpy. There was another row for this emissions point, C2DHE, that was a repeat and therefore deleted.”

Response:

WVDAQ agrees that the changes need clarification. The deleted row in the proposed permit was changed so that the row in Table 5.1.2. for C2DHE with limits of 3.25 pph and 0.13 tpy is shown as deleted and the remaining row with limits of 0.11 pph and 0.50 tpy is shown with the limit of 0.50 tpy changed to 0.49 tpy. The end result is the same, with Emission Point ID C2DHE, having VOC limits of 0.11 pph and 0.49 tpy.

Comment 2:

In Table 5.1.1 – PM₁₀ Emission Limits, concerning the limits for Emission Point ID C2EUE, the limits are supposed to be 0.02 pph and 0.02 tpy to match R13-1953M.

Response:

WVDAQ agrees with the comment. The PM₁₀ limit for C2EUE in Table 5.1.1 was changed from 0.01 pph and 0.01 tpy to 0.02 pph and 0.02 tpy.