

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 December 14, 2016.

Permit Number: **R30-10700001-2016**
Applications Received: **July 2, 2018 and September 13, 2018**
Plant Identification Number: **107-00001**
Permittee: **E. I. du Pont de Nemours and Company**
Facility Name: **Washington Works**
Manufacturing Unit: **Nylon Resins Production (Part 5 of 14)**
Mailing Address: **P. O. Box 2800, Washington, WV 26181-2800**

Permit Action Number: MM03 and MM04 Revised: February 12, 2019

Physical Location: Washington, Wood County, West Virginia
UTM Coordinates: 442.27 km Easting • 4,346.57 km Northing • Zone 17
Directions: Route 68 west from Parkersburg to intersection of Route 892. Continue west on Route 892 with the plant being on the north side about one mile from the intersection of Routes 68 and 892.

Facility Description

The purpose of these modifications is to allow an alternative compliance monitoring scenario to calculate emissions for Scrubbers 152Z-1C, 152Z-2C, and 152Z-42C, as well as an alternative scenario to show compliance with the proper operation of the Demister 152Z-45C.

Emissions Summary

There are no changes in emissions as a result of these modifications.

Title V Program Applicability Basis

With the proposed changes associated with this modification of the Nylon Area Permit, this facility as a whole 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 of aggregated HAPs. DuPont 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:	45CSR13	Construction/Modification Permits
	45CSR30	Operating Permit Requirement
State Only:	N/A	

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

Permit or Consent Order Number	Date of Issuance	Permit Determinations or Amendments That Affect the Permit (<i>if any</i>)
R13-1145F	September 10, 2018	
R13-1145G	November 16, 2018	

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 B, which may be downloaded from DAQ's website.

Determinations and Justifications

Revisions have been made in the operating permit for the reasons detailed below.

MM03

1. **45CSR13, Permit No. R13-1145F.** This underlying permit Class I Administrative Update was issued to allow a change for Scrubbers 152Z-1C, 152Z-2C, and 152Z-42C, during periods when the evaporator and the autoclaves are not venting at peak rate in any 60-minute period. The emission calculations will be determined in accordance with Appendix #9 and as listed below:

During normal operating periods, the emissions from the scrubbers will comply with the permit limits provided the scrubber monitoring parameters are within the permit limits for water flow rate and water temperature. The monitoring limits and permit emission limits were set for maximum load conditions where the evaporator and two of three autoclaves are venting at peak rate in any 60-minute period.

Because the operation of the evaporators and autoclaves must be scheduled in order to use common utilities and product handling equipment, and because each source actively vents for only a part of its batch cycle period, the typical operating scenario is that two sources, the evaporator and one autoclave, are venting at the same time. There are only brief periods when the evaporator and two autoclaves are venting.

If the unit is not venting three sources to the scrubber, then the emission limit might not be exceeded even if the scrubber water flow becomes limited or the water temperature is high. The calculation described here will provide an emission estimate based on the number of units venting and the duration of the venting, water flow, and water temperature. It is not common for all three sources to be venting at max rates in the same hour, and process operators are often able to stop or suspend the initiation of a batch, but it is not possible to immediately cease emissions until temperatures are reduced and it is not advisable to suspend a batch that has been started beyond a certain point.

Per the current permit, a monitoring deviation is recorded if the scrubber water flow goes below the monitoring limits (170 gpm for scrubbers 1 [152Z-1C] & 2 [152Z-2C], 145 gpm for scrubber 6 [152Z-42C]) or above the water temperature limits of 55 C for any scrubber. The proposed change to this monitoring requirement is to allow calculation of the emissions at the process conditions during any flow or temperature exceedance event. If the emissions do not exceed the permit limit, then the event would not be cited as a deviation from the monitoring or emission limit requirements.

The emission calculation will be determined as follows:

1. Construct a timeline for the event beginning at the actual time when the monitored parameter went out of limits and ending when the parameter was restored above the limit or when all sources have ceased venting.
2. Select the worst case 60-minute period of the event based on when the greatest number of sources were venting. This should be at the beginning of the event because no new batches will be started.
3. From vent valve position records, and looking at the worst-case hour, determine the number of minutes during which the sources were actually venting, grouped into periods for "evaporator plus 2 autoclaves", "evaporator plus one autoclave", and "evaporator only". Also determine the number of minutes in that hour when no sources were venting.
4. For each of the identified periods, enter the number of minutes into the time duration column of each table that describes the number of sources that were venting.
5. In each table pick a water temperature based on the average of actual readings at the time of that situation. The normal temperature is 40°C. Use the column for 55°C if the actual average water temperature is above 45°C. Use the column for 25°C water if the actual average water temperature is 30°C or below.
6. For each situation of number of sources venting, refer to the table for that number of sources, enter the number of minutes for the duration of that condition, find the row with the actual water flow rate observed during that period and select the closest temperature column to identify the number of pounds of particulate emitted in that period.
7. Sum up the emission numbers for each period of the hour. If the calculated emission rate in pounds per 60-minute period exceeds the permit limit for that scrubber, then the limit was exceeded, which is a permit deviation but the event is not also a deviation for the monitoring requirement.

The emission calculation is based on the heat and material balance for scrubber 2 which has the most stringent requirements for flow and temperature of the water. The calculations can be applied to the other scrubbers but will produce conservatively high estimates. The calculation curves have been reduced to a polynomial expression to facilitate the evaluation of emissions as a function of different process conditions.

$$\text{Emissions (lb/60 minutes)} = Ax^3 + Bx^2 + Cx + D, \text{ where } x = \text{water flow in gpm}$$

Factors:

Sources	Water Temp °C	A	B	C	D
Evap & 2 A/C	25	0	1.89E-04	-7.09E-02	6.65
Evap & 2 A/C	40	0	1.65E-04	-7.48E-02	8.5
Evap & 2 A/C	55	0	5.48E-05	-4.09E-02	7.08
Evap & 1 A/C	25	0	1.78E-04	-6.48E-02	5.92
Evap & 1 A/C	40	0	2.08E-05	-2.37E-02	3.98
Evap & 1 A/C	55	7.92E-07	-3.72E-04	3.96E-02	1.06
Evap only	25	2.10E-06	-5.35E-04	2.31E-02	1.53
Evap only	40	0	-3.11E-05	-9.36E-03	2.42
Evap only	55	3.59E-07	-1.70E-04	1.22E-02	1.89

The emission numbers resulting from this calculation represent the emissions in a 60-minute period when the sources are venting at maximum rate. The actual periods of maximum emission rate are typically a few minutes, and depend on the autoclave and the product type.

Changes to the Permit from this Modification include:

Condition 5.4.2. – If the recorded parameters should fall outside the given ranges to the existing parameters in previous Condition 5.4.2, then the Permittee shall calculate the emission to each impacted vent point using the method described in Application R13-1145F using the emission equations listed above with the regression parameters in the above table.

2. **45CSR13, Permit No. R13-1145G.** The permittee requested a change to a more accurate parameter monitoring approach for the autoclave demister device 152Z-45C as described below:

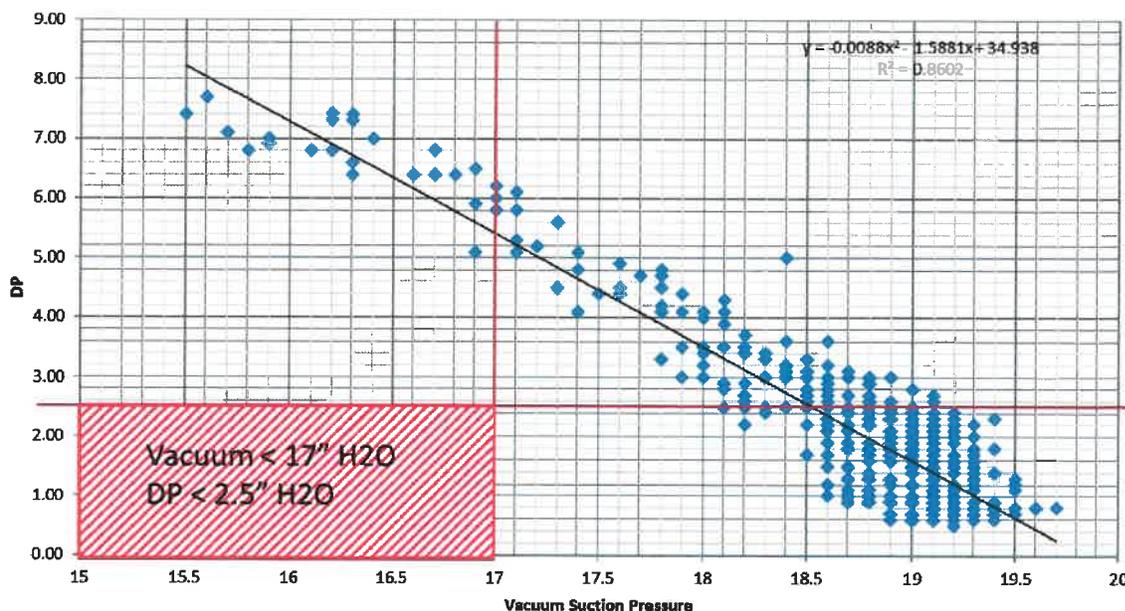
Compliance Monitoring for Autoclave Die Head Demister

Fumes are emitted when molten polymer is removed from the individual autoclaves through die heads at the bottoms of the autoclaves, described as source 152Z-45S. An air pick up system is in place to prevent excessive fumes in the work place. The air flow from the pickup points passes through a demister, 152Z-45C to prevent excess emissions to the atmosphere.

When the system was first described for permitting, all pickup points were open at all times and the pressure drop across the demister filter media was always greater than 2.5 w.c. if the media was properly positioned in the device. More recently the individual air pickup points were equipped with shut off doors to allow the air flow to be stopped for periods between active polymer drops. This was necessary in order to prevent formation of black specks due to overheating of polymer between drops. When several or most of the air pickup points are blocked, the pressure drop across the filter media often drops below 2.5 w.c. because the pressure drop (DP) is proportional to the reduced air flow.

For the reduced flow situation, proper operation of the demister is assured if the pressure at the suction port of the device is more negative than -17" w.c. The following data (plotted) was observed for normal operation over a three-week period with many combinations of open and closed pickup points. Any data points that show a pressure drop (DP) below 2.5" w.c. have suction-side values well above -17" w.c.

If the filter media was not placed correctly, then the pressure drop (DP) readings would be low, but the suction pressure readings would be well above -17" w.c.



If the filter media was not placed correctly, then the pressure drop (DP) readings would be low, but the suction pressure readings would be well above -17" w.c., in the red shaded area of the plot.

The data plot shown is for data points based on 1-minute averages. DuPont requested that the compliance monitoring requirement be based on daily averages, which is consistent with the existing permit condition for a single daily reading for the demister pressure differential.

Changes to the Permit from this Modification include:

Condition 5.4.6. – The pressure drop across the demister was required to be greater than 2.5" w.c. (inches water column). This has been revised to greater than or equal to 2.5" w.c., or, if below, the daily average gauge pressure (vs. atmosphere) shall be more negative (i.e. smaller) than -17" w.c. (inches water column) before the packing shall be inspected for possible replacement or redistribution.

3. **Miscellaneous Changes.** Section 1.2 has been updated to reflect to most current version of the R13 Permit. The Table of Contents has been renumbered accordingly.

Non-Applicability Determinations

The following requirements have been determined not to be applicable to the subject facility due to the following:

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: N/A

Ending Date: N/A

Point of Contact

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

Mike Egnor
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone: 304/926-0499 ext. 1208 • Fax: 304/926-0478
michael.egnor@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)

Due to comments on February 6, 2019 from the Acting Director of the WV Division of Air Quality, the issued Permit was modified from the Proposed Permit as follows:

Condition 5.4.2 of the Proposed Permit referenced using a method approved by the agency in order to calculate emissions directly when Scrubbers 1 [152Z-1C], 2 [152Z-2C], and 6 [152Z-42C] are not venting at peak rate in any 60-minute period. In order to include all applicable requirements in the Title V Permit, the specific emission calculations are now added as Attachment #9 of the Permit, and this Attachment is now cited in Condition 5.4.2.