



Department of  
Environmental  
Conservation

# Perfluoroalkyl Substances (PFAS) Emissions Investigation – Taconic Facility, Petersburg, NY

National Association of Clean Air Agencies  
Fall Membership Meeting  
Cleveland, Ohio  
October 16, 2018

# Background

- Taconic manufactures polytetrafluoroethylene (PTFE) coated fiberglass/fabric products for industrial applications and the food processing industry.
- The process involves the use of woven fiberglass fabric dipped into a PTFE aqueous dispersion, where the coated fabric passes through ovens to be dried and baked. Oven temperature vary to properly bond the PTFE to the fabric.
- The process results in the liberation of PFAS polymerization aides that are used in the PTFE dispersions and highly toxic PTFE decomposition products. The primary fluoropolymer aide was perfluorooctanoic acid (PFOA), it has been replaced with other aides (DuPont trade name GEN-X).



# Background

- The emissions from these PTFE coating lines are controlled by Fume Eliminator (FE) air pollution control devices.
- NYSDEC required Taconic to conduct an inlet/outlet emission test of one FE for 24 PFAS's using a modified method 5 sampling train and analyzed by method 537.
- The FE tested collected emissions from 15 PTFE vertical oven coating lines. Maximum production rate.
- Testing was completed on December 7, 2016.
- Test results were presented at the February 21, 2017 public meeting in Petersburg, NY.

# Fume Eliminator

- A two stage air pollution control device used to collect the submicron particulate matter released during the sintering of the PTFE.
- The fiberbed diffusion filters are designed to collect both solid and liquid particulate.
- Exhaust is cooled to 120°F with a Cyclonic Scrubber which condenses the pollutants into water droplets.
- The water droplets fall into the sump of the air pollution control device.
- Water is recirculated and automatically added to compensate for evaporative losses.
- The remaining exhaust moves through a pre-filter to further remove foulants to protect the main fiber bed.



# Fume Eliminator

- Precooled/pre-filtered exhaust enters a bed of densely packed fiberbed filters to achieve the final removal of the aerosols.
- Cleaned air exits to stack.
- Manufacturer guarantee of opacity levels to 5% or less and maximum outlet discharge (particulate)  $\leq 0.01$  grains/dscf
- Actual PM test results (0.002 grains/dscf)





# Emission Testing Results

The results found five PFAS in the outlet stack emissions at extremely small amounts.

- Perfluorobutanoic Acid – PFBA (C<sub>4</sub>) @ 2.6 grams/year
- Perfluoropentanoic Acid – PFPeA (C<sub>5</sub>) @ 1.25 grams/year
- Perfluorooctanoic Acid – PFOA (C<sub>8</sub>) @ 3.75 grams/year
- Perfluorononanoic Acid – PFNA (C<sub>9</sub>) @ 3.12 grams/year
- Perfluoroundecanoic Acid – PFUnA (C<sub>11</sub>) @ 1.25 grams/year
- Hexafluoropropylene Oxide Dimer Acid – HFPO-DA @ <1.25 grams/year

# Sump Water Testing Results

## Sump Water Results

Perfluoroheptanoic Acid – PFHpA (C <sub>7</sub> )	6.3 – 12 ppb
Perfluorononanoic Acid – PFNA (C <sub>9</sub> )	5.0 – 11 ppb
Perfluorooctanoic Acid – PFOA (C <sub>8</sub> )	56 – 120 ppb

## Supply Water Results

Perfluorooctanoic Acid – PFOA (C <sub>8</sub> )	17 – 32 ppt
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# Air Pollution Control Efficiency

- 88 % removal for total measured PFAS.
- 78 % removal for PFOA.
- GEN- X (PFOA replacement) as measured by HFPO-DA was reduced to non-detectable amounts at outlet (> 99 % control).
- The Fume Eliminators are effectively reducing the PFAS, particulate and hydrogen fluoride emissions.

# Follow Up Investigation

- What was evaluated: **Use of water containing PFOA.**
- Following the results of December 2016 Sampling/Testing, Taconic was required to analyze FE11 Sump for presence of PFOA.
- This air pollution control device was installed in 2014 when the facility expanded operations.
- PFOA containing dispersions had never been used in associated ovens and all water sources have been filtered to non detect during their entire operation. Therefore PFOA should not have been detected in sump water.
- PFOA was detected at 0.37 ppb in the FE 11 sump.

# Follow Up Investigation

- What was evaluated: **Chemicals currently being used by Taconic in PTFE manufacturing.**
- DEC required Taconic to analyze the current PTFE dispersions in use for PFOA/PFAS content.
- Each dispersions was sampled twice for Quality Assurance
- Some PTFE Dispersions contained a trace amounts of PFOA (ND - 110 ppb).
- Other PFAS found at trace levels in all dispersions
- Taconic had been under the assumption dispersions they purchased were PFOA free per the EPA Stewardship Agreement with PFAS manufacturers to phase out PFOA use.

# Thank You

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